

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

CIRBA INC. (d/b/a DENSIFY)
and CIRBA IP, INC.,

Plaintiffs/Counter-Defendants,

v.

VMWARE, INC.,

Defendant/Counter-Plaintiff.

C.A. No. 19-742-LPS

JURY TRIAL DEMANDED

**DEFENDANT VMWARE, INC.’S ANSWER AND COUNTERCLAIMS
TO CIRBA’S FIRST AMENDED COMPLAINT**

Defendant VMware, Inc. (“VMware”) responds to the First Amended Complaint (D.I. 68) filed on June 18, 2019 (the “Complaint”) by Plaintiffs Cirba Inc. (d/b/a Densify) and Cirba IP, Inc. (collectively, “Cirba”) and asserts its own counterclaims. VMware denies all allegations in the Complaint except for those specifically admitted below.

VMWARE’S ANSWER TO CIRBA’S FIRST AMENDED COMPLAINT

NATURE OF THE ACTION

1. In answer to Paragraph 1, VMware denies that Cirba is a “quintessential start-up success story.” VMware lacks information sufficient to form a belief as to the truth of the remaining allegations of Paragraph 1 and therefore denies them.
2. In answer to Paragraph 2, VMware denies that Cirba is an “industry leader.” VMware lacks information sufficient to form a belief as to the truth of the remaining allegations of Paragraph 2 and therefore denies them.
3. In answer to Paragraph 3, VMware denies that, “[f]or years, [Cirba’s] products have led the industry in optimization, competing effectively based on its innovations and

foundational patent protection.” VMware lacks information sufficient to form a belief as to the truth of the remaining allegations of Paragraph 3 and therefore denies them.

4. VMware denies the allegations of Paragraph 4.
5. VMware denies the allegations of Paragraph 5.
6. In answer to Paragraph 6, VMware admits that “99% of *Fortune 1000* companies reportedly are VMware customers” and that global revenues in 2018 exceeded \$2 billion. VMware lacks information sufficient to form a belief as to the truth of Cirba’s allegation that it “has invested years and millions of dollars to develop and commercialize products embodying its intellectual property” and therefore denies it. VMware denies the remaining allegations of Paragraph 6.

7. In answer to Paragraph 7, VMware lacks information sufficient to form a belief as to the truth of Cirba’s allegation that it “has not licensed its patents to competitors” and therefore denies it. The remaining allegations of Paragraph 7 state legal conclusions, which do not require an admission or denial. But if a response is required, VMware lacks information sufficient to form a belief as to their truth and therefore denies them.

8. VMware denies the allegations of Paragraph 8.
9. The allegations of Paragraph 9 state legal conclusions, which do not require an admission or denial. But if a response is required, VMware denies them.

THE PARTIES

10. VMware lacks information sufficient to form a belief as to the truth of the allegations of Paragraph 10 and therefore denies them.

11. VMware lacks information sufficient to form a belief as to the truth of the allegations of Paragraph 11 and therefore denies them.

12. VMware admits the allegations of Paragraph 12.

JURISDICTION AND VENUE

13. In answer to Paragraph 13, VMware admits that the Complaint purports to bring a civil action for patent infringement, unfair competition under the Lanham Act, 15 U.S.C. § 1125(a), deceptive trade practices under Delaware Code Title 6 § 2532, and common law trademark infringement. The remaining allegations of Paragraph 13 state legal conclusions, which do not require an admission or denial. But if a response is required, VMware denies them.

14. The allegations of Paragraph 9 state legal conclusions, which do not require an admission or denial. But if a response is required, VMware denies them.

15. In answer to Paragraph 15, VMware does not contest that venue is proper in this Court for purposes of this action. VMware admits that its customers have included the University of Delaware, Alliant Credit Union, Rent-A-Center, Cardinal Health, and the Make-A-Wish Foundation of America. VMware denies the remaining allegations of Paragraph 15.

16. In answer to Paragraph 16, VMware admits that it offers for sale and sells products and services in the State of Delaware and does not contest that this Court has personal jurisdiction over it for purposes of this action. VMware denies that its products and services infringe. The remaining allegations of Paragraph 16 state legal conclusions, which do not require an admission or denial. But if a response is required, VMware denies them.

BACKGROUND

A. Densify And Its Technology

17. VMware lacks information sufficient to form a belief as to the truth of the allegations of Paragraph 17 and therefore denies them.

18. In answer to Paragraph 18, VMware admits that some companies deploy IT infrastructure, including computing, storage, and networking equipment, on their premises and

that servers can run workloads. VMware lacks information sufficient to form a belief as to the truth of the remaining allegations of Paragraph 18 and therefore denies them.

19. In answer to Paragraph 19, VMware admits that companies can deploy significant equipment and many physical servers. VMware lacks information sufficient to form a belief as to the truth of the remaining allegations of Paragraph 19 and therefore denies them.

20. In answer to Paragraph 20, VMware admits that virtualization can refer to the process of creating a software-based or virtual representation of something, such as virtual applications, servers, storage, and networks. VMware also admits that virtualization may be able to create efficiencies, depending on the context. VMware lacks information sufficient to form a belief as to the truth of the remaining allegations of Paragraph 20 and therefore denies them.

21. In answer to Paragraph 21, VMware admits that a virtual machine can be created within a computing environment and that multiple virtual machines may be able to exist in a host, depending on the context. VMware also admits that a hypervisor can be used to create and run virtual machines. VMware lacks information sufficient to form a belief as to the truth of the remaining allegations of Paragraph 21 and therefore denies them.

22. In answer to Paragraph 22, VMware admits that a virtual machine is sometimes referred to as a “guest,” the computing environment in which it is created is sometimes referred to as a “host,” and multiple virtual machines may be able to exist in a host, depending on the context. VMware denies the remaining allegations of Paragraph 22.

23. In answer to Paragraph 23, VMware admits that a group of hosts is sometimes referred to as a “cluster” and that it may be possible to manage the resources of the hosts within the cluster. VMware denies the allegations of Paragraph 23.

24. VMware denies the allegations of Paragraph 24.

25. VMware denies the allegations of Paragraph 25.

26. VMware denies the allegations of Paragraph 26.

27. VMware lacks information sufficient to form a belief as to the truth of the allegations of Paragraph 27 and therefore denies them.

28. VMware lacks information sufficient to form a belief as to the truth of the allegations of Paragraph 28 and therefore denies them.

29. VMware lacks information sufficient to form a belief as to the truth of the allegations of Paragraph 29 and therefore denies them.

30. VMware lacks information sufficient to form a belief as to the truth of the allegations of Paragraph 30 and therefore denies them.

31. VMware lacks information sufficient to form a belief as to the truth of the allegations of Paragraph 31 and therefore denies them.

B. VMware And Its Technology

32. In answer to Paragraph 32, VMware admits that it provides cloud computing and virtualization software and services; that it was founded in 1998; that it entered the server market in 2001; that it is a leader in virtualization software; that it has expanded its offerings; and that it is known for its innovation of the hypervisor. VMware denies the remaining allegations of Paragraph 32.

33. In answer to Paragraph 33, VMware admits that it innovated server virtualization. VMware denies the remaining allegations of Paragraph 33.

34. In answer to Paragraph 34, VMware admits that it has been successful in the marketplace and that it has acquired other companies with innovative technology. VMware denies the remaining allegations of Paragraph 34.

35. In answer to Paragraph 35, VMware admits that in 2008, Paul Maritz took over for former VMware President and CEO Diane Greene. VMware admits that Paul Maritz was a former Microsoft employee and former President of EMC's Cloud Computing Division. VMware denies the remaining allegations of Paragraph 35.

36. In answer to Paragraph 36, VMware admits that it has acquired other companies with innovative technology. VMware denies the remaining allegations of Paragraph 36.

37. In answer to Paragraph 37, VMware admits that some companies have shifted away from on-premises to cloud-based applications and that its virtualization software has reshaped the computer industry. VMware denies the remaining allegations of Paragraph 37.

38. In answer to Paragraph 38, VMware admits that it offers or has offered technologies such as vRealize Operations (“vROps”), vRealize Automation (“vRA”), Distributed Power Manager (“DPM”), Distributed Resource Scheduler (“DRS”), Storage DRS (“sDRS”), High Availability (“HA”), VMware Cloud Foundation, Project Dimension, vSphere, vCenter Server, vCloud Director, Cloud Provider Pod, vRealize Suite, vRealize Suite Lifecycle Manager, vCloud Suite, vRealize Business for Cloud, vRealize Operations for Horizon, and vCloud NFV. VMware also admits that some of its products and services may be related and sold as a suite. VMware denies the remaining allegations of Paragraph 38.

39. In answer to Paragraph 39, VMware admits that the “vRealize Operations Manager 7.0 Help” publication (dated Feb. 22, 2019, and available at <https://docs.vmware.com/en/vRealize-Operations-Manager/7.0/vrealize-operations-manager-70-help.pdf>) states: “With vRealize Operations Manager enterprise software, you can proactively identify and solve emerging issues with predictive analysis and smart alerts, ensuring optimal performance and availability of system resources - across physical, virtual, and cloud

infrastructures. vRealize Operations Manager gives you complete monitoring capability in one place, across applications, storage, and network devices, with an open and extensible platform supported by third-party management packs. In addition, vRealize Operations Manager increases efficiency by streamlining key processes with preinstalled and customizable policies while retaining full control. Using data collected from system resources (objects), vRealize Operations Manager identifies issues in any monitored system component, often before the customer notices a problem.” VMware denies the remaining allegations of Paragraph 39.

40. In answer to Paragraph 40, VMware admits that it has developed a hypervisor known as ESXi. VMware admits that the “Understanding vSphere DRS Performance, VMware vSphere 6” publication (available at <https://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/techpaper/vsphere6-drs-perf.pdf>) states: “DRS works on a cluster of ESXi hosts and provides resource management capabilities like load balancing and virtual machine (VM) placement. DRS also enforces user-defined resource allocation policies at the cluster level, while working with system-level constraints.” VMware admits that the “Understanding vSphere DRS Performance, VMware vSphere 6” publication (available at <https://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/techpaper/vsphere6-drs-perf.pdf>) states: “The main goal of DRS is to ensure that VMs and their applications are always getting the compute resources that they need to run efficiently.” VMware denies the remaining allegations of Paragraph 40.

41. In answer to Paragraph 41, VMware admits that the “VMware vRealize Automation” publication (available at <https://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/products/vrealize/vmware-whats-new-vrealize-automation.pdf>) states: “VMware vRealize® Automation™, part of VMware vRealize Suite, empowers IT to accelerate the provisioning and delivery of IT

services, across infrastructure, containers, applications and custom services.” VMware admits that the “Foundations and Concepts” publication at 5 (dated July 18, 2019, and available at <https://docs.vmware.com/en/vRealize-Automation/7.5/vrealize-automation-75-foundations-and-concepts.pdf>) states: “VMware vRealize™ Automation provides a secure portal where authorized administrators, developers, or business users can request new IT services. In addition, they can manage specific cloud and IT resources that enable IT organizations to deliver services that can be configured to their lines of business in a self-service catalog.” VMware denies the remaining allegations of Paragraph 41.

42. In answer to Paragraph 42, VMware admits that the “VMware Distributed Power Management Concepts and Use” publication (available at <https://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/techpaper/Distributed-Power-Management-vSphere.pdf>) states: “VMware® Distributed Power Management (VMware DPM) provides additional power savings beyond this initial benefit by dynamically consolidating workloads even further during periods of low resource utilization. Virtual machines are migrated onto fewer hosts and the un-needed ESX hosts are powered off. When workload demands increase, ESX hosts are powered back on and virtual machines are redistributed to them. VMware DPM is an optional feature of VMware® Distributed Resource Scheduler (VMware DRS).” VMware denies the remaining allegations of Paragraph 42.

43. In answer to Paragraph 43, VMware admits that the “VMware vSphere Resource Management” publication at 105 (dated Jan. 11, 2019, and available at <https://docs.vmware.com/en/VMware-vSphere/6.7/vsphere-esxi-vcenter-server-671-resource-management-guide.pdf>) states: “Storage DRS allows you to manage the aggregated resources of a datastore cluster. When Storage DRS is enabled, it provides recommendations for virtual

machine disk placement and migration to balance space and I/O resources across the datastores in the datastore cluster.” VMware denies the remaining allegations of Paragraph 43.

44. In answer to Paragraph 44, VMware admits that the “vSphere Availability” publication (dated Apr. 11, 2019, and available at <https://docs.vmware.com/en/VMware-vSphere/6.7/vsphere-esxi-vcenter-server-672-availability-guide.pdf>) states: “vSphere HA provides high availability for virtual machines by pooling the virtual machines and the hosts they reside on into a cluster. Hosts in the cluster are monitored and in the event of a failure, the virtual machines on a failed host are restarted on alternate hosts.” VMware denies the remaining allegations of Paragraph 44.

C. Densify and VMware’s Relationship

45. In answer to Paragraph 45, VMware admits that Cirba and VMware compete in certain contexts. VMware further admits that Cirba has developed technology that relies on VMware’s innovations in virtualization. VMware lacks information sufficient to form a belief as to the truth of the remaining allegations of Paragraph 45 and therefore denies them.

46. In answer to Paragraph 46, VMware admits that many major companies use VMware’s virtualization platform. VMware lacks information sufficient to form a belief as to the truth of the remaining allegations of Paragraph 46 and therefore denies them.

47. In answer to Paragraph 47, VMware lacks information sufficient to form a belief as to the truth of the allegations of Paragraph 47 and therefore denies them.

48. In answer to Paragraph 48, VMware admits that approximately 99% of *Fortune 1000* companies are VMware customers. VMware admits that it has invited speakers and analysts for VMworld, a well-known industry tradeshow. VMware denies the remaining allegations of Paragraph 48.

D. VMware Copied Densify's Technology

49. VMware denies the allegations of Paragraph 49.
 50. In answer to Paragraph 50, VMware admits that it previewed a demo version of vROps 6.1 at VMworld 2015. VMware further admits that the “Environment Density” tab was depicted as one of many, many vROps features. VMware denies the remaining allegations of Paragraph 50.
 51. VMware denies the allegations of Paragraph 51.
 52. VMware denies the allegations of Paragraph 52.
 53. In answer to Paragraph 53, VMware admits that at least one version of vROps, 6.1, has an Environment Density tab. VMware denies the remaining allegations of Paragraph 53.
 54. VMware denies the allegations of Paragraph 54.
 55. VMware denies the allegations of Paragraph 55.
 56. In answer to Paragraph 56, VMware admits that it released vROps version 7.0 in September 2018. VMware admits that the “What’s New in vRealize Operations 7.0” blog entry by Taruna Gandhi (posted on August 27, 2018, and available at <https://blogs.vmware.com/management/2018/08/whats-new-in-vrealize-operations-7-0.html>) states: “Now, you will be able to teach DRS your business intent and control not only balancing across clusters, but also which host within a cluster the workload will land on.” VMware denies the remaining allegations of Paragraph 56.
 57. VMware denies the allegations of Paragraph 57.
 58. VMware denies the allegations of Paragraph 58.
- E. VMware’s Infringement of Densify’s Intellectual Property**
59. VMware denies the allegations of Paragraph 59.

1. The '687 Patent

60. In answer to Paragraph 60, VMware admits that the face of U.S. Patent No. 8,209,687 (“the '687 patent”) lists its title as “Method and System for Evaluating Virtualized Environments,” its inventors as Tom Silangan Yuyitung and Andrew Derek Hillier, and its issue date as June 26, 2012, and refers to an August 31, 2007 provisional application. VMware also admits that what purports to be a copy of the '687 patent is attached to the First Amended Complaint as Exhibit 12. VMware denies the remaining allegations of Paragraph 60.

61. In answer to Paragraph 61, VMware admits that column 1, lines 26 to 41 of the '687 patent states: “As a result, the IT infrastructures used by many organizations have moved away from reliance on centralized computing power and towards more robust and efficient distributed systems. While the benefits of a distributed approach are numerous and well understood, there has arisen significant practical challenges in managing such systems for optimizing efficiency and to avoid redundancies and/or under-utilized hardware. In particular, one challenge occurs due to the sprawl that can occur over time as applications and servers proliferate. Decentralized control and decision making around capacity, the provisioning of new applications and hardware, and the perception that the cost of adding server hardware is generally inexpensive, have created environments with far more processing capacity than is required by the organization.” VMware denies the remaining allegations of Paragraph 61.

62. In answer to Paragraph 62, VMware admits that column 1, lines 42 to 54 of the '687 patent states: “When cost is considered on a server-by-server basis, the additional cost of having underutilized servers is often not deemed to be troubling. However, when multiple servers in a large computing environment are underutilized, having too many servers can become a burden. Moreover, the additional hardware requires separate maintenance considerations; separate upgrades and requires the incidental attention that should instead be optimized to be

more cost effective for the organization. Heat production and power consumption can also be a concern. Even considering only the cost of having redundant licenses, removing even a modest number of servers from a large computing environment can save a significant amount of cost on a yearly basis.” VMware denies the remaining allegations of Paragraph 62.

63. In answer to Paragraph 63, VMware admits that column 1, lines 55 to 57 of the ’687 patent states: “As a result, organizations have become increasingly concerned with such redundancies and how they can best achieve consolidation of capacity to reduce operating costs.” VMware also admits that column 2, lines 12-21 of the ’687 patent states: “Complex systems configurations, diverse business requirements, dynamic workloads and the heterogeneous nature of distributed systems can cause incompatibilities between systems. These incompatibilities limit the combinations of systems that can be consolidated successfully. In enterprise computing environments, the virtually infinite number of possible consolidation permutations which include suboptimal and incompatibility system combinations make choosing appropriate consolidation solutions difficult, error-prone and time consuming.” VMware denies the remaining allegations of Paragraph 63.

64. In answer to Paragraph 64, VMware admits that column 5, line 52 to column 6, line 4 of the ’687 patent states: “It has been recognized that virtualization often involves more than considering sizing, for example, it is beneficial to understand all the constraints that govern and impact a target environment and ensure that these constraints are taken into account when planning and managing a virtual environment. This has been found to be particularly true of virtualization infrastructures such as VMware Infrastructure®, where sophisticated features such as VMotion, distributed resource scheduling (DRS) and HA require careful planning and diligent administration of virtual environments. It has been found that to fully realize the capabilities of

the virtualization infrastructure, the virtualization scheme being used should be combined with accurate intelligence and focused analytics in order to safely and effectively transform existing systems into a new virtual paradigm. In order to provide such intelligence and focused analytics, an analysis program for determining compatibilities in a computing environment 12 can be utilized along with specific virtualization rule sets and user interfaces (UIs) to address the considerations of a virtualization infrastructure.” VMware denies the remaining allegations of Paragraph 64.

65. In answer to Paragraph 65, VMware admits that claim 7 of the ’687 patent states, in part: “evaluating the placement of said virtual machines in said virtualized environment using said data sets by evaluating each virtual guest against each virtual host and other virtual guests using one or more rule sets pertaining to said technical, business and workload constraints to determine guest-host placements . . .” VMware denies the remaining allegations of Paragraph 65.

66. In answer to Paragraph 66, VMware admits that the column 12, lines 19 to 33 of the ’687 patent states: “Rules comprised by a rule set 28 may reference common parameters but perform different tests to identify different forms of incompatibilities that may have different levels of importance. For example a version four operating system versus a version three operating system may be considered less costly to remedy and thus less detrimental than a version five operating system compared to a version one operating system. As can be seen, even though the operating systems are different in both cases, the nature of the difference can also be considered and different weights and/or remedies applied accordingly. Rules can also test for similarities that indicate contentions which can result in incompatibilities between systems. For example, rules can check for name conflicts with respect to system names, database instance

names, user names, etc.” VMware also admits that column 11, lines 38 to 39 refer to U.S. Patent Application No. 11/535,308. VMware denies the remaining allegations of Paragraph 66.

67. In answer to Paragraph 67, VMware admits that column 20, line 9 of the ’687 patent refers to “N-to-1” and “N-by-N” computability analyses. VMware also admits that Figure 5 of the ’687 patent refers to “1-to-1 Compatibility Analysis Results.” VMware also admits that the “VMware Distributed Resource Management: Design, Implementation, and Lessons Learned” publication by Ajay Gulati, Ganesha Shanmuganathan, Anne Holler, Carl Waldspurger, Minwen Ji, and Xiaoyun Zhu (available at <https://labs.vmware.com/vmtj/vmware-distributed-resource-management-design-implementation-and-lessons-learned>) states: “While VM-to-VM affinity was sufficient for most technical use-cases, there were other requirements such as software licensing that made administrators want to isolate VMs onto a set of hosts.”

VMware denies the remaining allegations of Paragraph 67.

68. In answer to Paragraph 68, VMware admits that claim 7 of the ’687 patent recites: “A method for validating an existing virtualized environment comprising a plurality of virtual machines placed on one or more virtual hosts, said method comprising: obtaining a data set for each of said plurality of virtual machines, each data set comprising information pertaining to technical, business and workload constraints associated with a corresponding virtual machine; evaluating the placement of said virtual machines in said virtualized environment using said data sets by evaluating each virtual guest against each virtual host and other virtual guests using one or more rule sets pertaining to said technical, business and workload constraints to determine guest-host placements; and identifying the existence of virtual machines with suboptimal placements to enable alternative placements for said virtual machines.” VMware denies the remaining allegations of Paragraph 68.

69. VMware denies the allegations of Paragraph 69.

70. In answer to Paragraph 70, VMware admits that the “Self-Driving Operations by VMware vRealize Operations, Datasheet” publication (available at <https://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/products/vCenter/vmware-vrealize-operations-datasheet.pdf>) states: “Self-driving operations by VMware vRealize® Operations™ delivers continuous performance optimization at minimal cost driven by business and operational intent, efficient capacity management, proactive planning, intelligent remediation, and integrated compliance. It automates and simplifies IT operations management, and provides unified observability from applications to infrastructure across hybrid cloud and multi-cloud environments.” VMware denies the remaining allegations of Paragraph 70.

71. In answer to Paragraph 71, VMware admits that the “vRealize Operations Manager 7.0 Help” publication (dated Feb. 22, 2019, and available at <https://docs.vmware.com/en/vRealize-Operations-Manager/7.0/vrealize-operations-manager-70-help.pdf>) states: (i) “vRealize Operations Manager collects performance data from monitored software and hardware resources in your enterprise and provides predictive analysis and real-time information about problems.” (ii) “vRealize Operations Manager monitors your ESXi hosts and the virtual machines located on them.” (iii) “vRealize Operations Manager monitors virtual machines running in a vCenter Server, analyzes longer-term historical data, and provides forecast data about predictable patterns of resource usage to Predictive DRS. Based on these predictable patterns, Predictive DRS moves to balance resource usage among virtual machines.” and (iv) “vRealize Operations Manager analytics provide precise tracking, measuring and forecasting of data center capacity, usage, and trends to help manage and optimize resource use, system tuning, and cost recovery.” VMware denies the remaining allegations of Paragraph 71.

72. In answer to Paragraph 72, VMware admits that the “vRealize Operations Manager 7.0 Help” publication (dated Feb. 22, 2019, and available at <https://docs.vmware.com/en/vRealize-Operations-Manager/7.0/vrealize-operations-manager-70-help.pdf>) states: (i) “The VM dashboard focuses on highlighting the key configurations of the virtual machines in your environment. You can use this dashboard to find inconsistencies in configuration within your virtual machines and take quick remedial measures.” and (ii) “Use the Workload Utilization widget to identify which workload objects are underutilized and overutilized.” VMware denies the remaining allegations of Paragraph 72.

73. VMware denies the allegations of Paragraph 73.

74. In answer to Paragraph 74, VMware admits that the “vRealize Operations Manager 7.0 Help” publication (dated Feb. 22, 2019, and available at <https://docs.vmware.com/en/vRealize-Operations-Manager/7.0/vrealize-operations-manager-70-help.pdf>) states: “You can use vCenter Server tagging to tag VMs, hosts, and/or clusters with specific tags. vRealize Operations Manager can be configured to leverage tags to define business-related placement constraints: VMs can only be placed on hosts/clusters with matching tags.” VMware denies the remaining allegations of Paragraph 74.

75. In answer to Paragraph 75, VMware admits that the “vRealize Operations Manager 7.0 Help” publication (dated Feb. 22, 2019, and available at <https://docs.vmware.com/en/vRealize-Operations-Manager/7.0/vrealize-operations-manager-70-help.pdf>) states: (i) “vRealize Operations Manager monitors virtual objects and collects and analyzes related data that is presented to you in graphical form at the Workload Optimization screen. Depending on what appears on the screen, you might use optimization functions to distribute a workload differently in a data center or custom data center. Or you may decide to

perform more research, including checking the Alerts page to determine if any alerts have been generated for objects of interest.” and (ii) “Workload Optimization provides for moving virtual compute resources and their file systems dynamically across datastore clusters within a data center or custom data center. Using Workload Optimization, you can rebalance virtual machines and storage across clusters, relieving demand on an overloaded individual cluster and maintaining or improving cluster performance. You can also set your automated rebalancing policies to emphasize VM consolidation, which potentially frees up hosts and reduces resource demand.” VMware denies the remaining allegations of Paragraph 75.

76. In answer to Paragraph 76, VMware admits that the “vRealize Operations Manager 7.0 Help” publication (dated Feb. 22, 2019, and available at <https://docs.vmware.com/en/vRealize-Operations-Manager/7.0/vrealize-operations-manager-70-help.pdf>), states: (i) “Workload Optimization offers you the potential to automate fully a significant portion of your cluster workload rebalancing tasks. The tasks to accomplish workload automation are as follows: 1 Configure the Workload Automation Details. See Workload Automation Details. 2 Tag VMs for cluster placement. See Business Intent - Host-Based Virtual Machine Placement and Business Intent: Tag-Based VM Placement in Clusters. 3 If you do not use the AUTOMATE function in the Optimization Recommendation pane at the Workload Automation screen, configure the two Workload Optimization alerts to be triggered when cluster CPU/memory limits are breached, and configure them as automated. When the alerts are automated, the actions calculated by Workload Optimization are run automatically. See Configuring Workload Optimization Alerts.” and (ii) “By using vCenter Server to tag hosts and VMs with specific tags, you make certain that when the system runs an optimization, it uses VM-

to-host tag matching to ensure that VMs are moved to - or stay with – the appropriate host.”

VMware denies the remaining allegations of Paragraph 76.

77. VMware lacks information sufficient to form a belief as to the truth of the allegations of Paragraph 77 and therefore denies them.

78. VMware denies the allegations of Paragraph 78.

2. The '367 Patent

79. In answer to Paragraph 79, VMware admits that the face of U.S. Patent No. 9,654,367 (“the '367 patent”) lists its title as “System and Method for Determining and Visualizing Efficiencies and Risks in Computing Environments,” its inventor as Andrew Derek Hillier, and its issue date as May 16, 2017, and refers to an August 16, 2012 application. VMware also admits that what purports to be a copy of the '367 patent is attached to the First Amended Complaint as Exhibit 16. VMware denies the remaining allegations of Paragraph 79.

80. In answer to Paragraph 80, VMware admits that column 1, lines 23 to 31 of the '367 patent states: “Modern data centers typically comprise hundreds if not thousands of servers. Each server supplies a finite amount of resource capacity, typically in the form of, but not limited to: central processing unit (CPU) capacity, memory or storage capacity, disk input/output (I/O) throughput, and network I/O bandwidth. Workloads running on these servers consume varying amounts of these resources. With the advent of virtualization and cloud technologies, individual servers are able to host multiple workloads.” VMware denies the remaining allegations of Paragraph 80.

81. In answer to Paragraph 81, VMware admits that column 1, lines 32 to 39 of the '367 patent states: “Percent CPU utilization, which corresponds to the ratio of CPU usage relative to CPU capacity, is a common measure of how effectively servers are being utilized. Various other metrics may be used to determine resource utilization for computing systems.

Organizations may wish to measure and evaluate efficiencies and risks in computing environments but often do not have convenient ways to perform such measurements and evaluations.” VMware denies the remaining allegations of Paragraph 81.

82. In answer to Paragraph 82, VMware admits that column 1, lines 48 to 52 of the ’367 patent refers to “computing at least one score quantifying efficiencies and/or risks associated with corresponding ones of the entities in the computing environment, based on the resource utilization or performance data, the capacity data, and the at least one operational policy.” VMware admits that the claim 1 of the ’367 patent recites, in part: “displaying an indicator for at least one of the plurality of computing entities in a graphical representation based on the corresponding score.” VMware denies the remaining allegations of Paragraph 82.

83. In answer to Paragraph 83, VMware admits that the April 22, 2016 Response to Office Action in U.S. Patent Application No. 11/180,438 stated: “[T]he technical problem is solved by the present invention by computing efficiency scores for computing entities based on resource utilization data, resource capacity data, and operational policies relating to resource allocation. These scores thus reflect conditions prevailing in an apparatus or system – in particular conditions as to the utilization and availability of resources (such as CPU/memory capacity) – and these conditions are visually indicated by generating a graphical display with an indicator for at least one computing entity.” VMware denies the remaining allegations of Paragraph 83.

84. In answer to Paragraph 84, VMware admits that claim 1 of the ’367 patent states, in part: “A method performed by a processor in a computing system, the method comprising: obtaining resource utilization or performance data pertaining to a plurality of computing entities in a computing environment, and capacity data specifying resource capacities for the plurality of

computing entities in the computing environment; obtaining at least one operational policy defining criteria to determine whether the utilization or performance of an entity is in an acceptable range relative to its capacity or performance limits; computing at least one score quantifying efficiencies and/or risks associated with corresponding ones of the entities in the computing environment, based on the resource utilization or performance data, the capacity data, and the at least one operational policy.” VMware denies the remaining allegations of Paragraph 84.

85. In answer to Paragraph 85, VMware admits that claim 1 of the ’367 patent states, in part: “displaying an indicator for at least one of the plurality of computing entities in a graphical representation based on the corresponding score; wherein each indicator is positioned in the graphical representation according to the corresponding score such that the positioned indicator shows in a spatial manner, relative efficiencies and/or risks for the corresponding entity by positioning the indicator in one of a first portion indicative of risk associated with having infrastructure in the computing environment that cannot service workload demands and meet criteria specified in the at least one operational policy, a second portion indicative of an amount of infrastructure in the computing environment that can service workload demands based on the at least one operational policy, or a third portion indicative of inefficiencies associated with having more than the required amount of infrastructure in the computing environment to service workload demands based on the at least one operational policy.” VMware denies the remaining allegations of Paragraph 85.

86. VMware denies the allegations of Paragraph 86.

87. VMware denies the allegations of Paragraph 87.

88. In response to Paragraph 88, VMware admits that the “vRealize Operations Manager 7.0 Help” publication (dated Feb. 22, 2019, and available at <https://docs.vmware.com/en/vRealize-Operations-Manager/7.0/vrealize-operations-manager-70-help.pdf>) states: (i) “vRealize Operations Manager analytics provide precise tracking, measuring and forecasting of data center capacity, usage, and trends to help manage and optimize resource use, system tuning, and cost recovery. The system monitors stress thresholds and alerts you before potential issues can affect performance. Multiple pre-set reports are available. You can plan capacity based on historical usage, and run what-if scenarios as your requirements expand.” and (ii) “Use the Capacity Optimization and Reclaim features to assess workload status and resource contention in data centers across your environment. You can determine time remaining until cpu, memory, or storage resources run out and realize cost savings when underutilized VMs can be reclaimed and deployed where needed.” VMware denies the remaining allegations of Paragraph 88.

89. In answer to Paragraph 89, VMware admits that the “vRealize Operations Manager 7.0 Help” publication (dated Feb. 22, 2019, and available at <https://docs.vmware.com/en/vRealize-Operations-Manager/7.0/vrealize-operations-manager-70-help.pdf>) states: (i) “vRealize Operations Manager monitors your ESXi hosts and the virtual machines located on them.” and (ii) “vRealize Operations Manager monitors virtual machines running in a vCenter Server, analyzes longer-term historical data, and provides forecast data about predictable patterns of resource usage to Predictive DRS. Based on these predictable patterns, Predictive DRS moves to balance resource usage among virtual machines.” VMware denies the remaining allegations of Paragraph 89.

90. In answer to Paragraph 90, VMware admits that the “vRealize Operations Manager 7.0 Help” publication (dated Feb. 22, 2019, and available at <https://docs.vmware.com/en/vRealize-Operations-Manager/7.0/vrealize-operations-manager-70-help.pdf>) states: (i) “vRealize Operations Manager Administrators assign policies to object groups and applications to support Service Level Agreements (SLAs) and business priorities. When you use policies with object groups, you ensure that the rules defined in the policies are quickly put into effect for the objects in your environment.” and (ii) “Use host-based VM placement to tie your VMs more closely to your infrastructure. By using vCenter Server to tag hosts and VMs with specific tags, you make certain that when the system runs an optimization, it uses VM-to-host tag matching to ensure that VMs are moved to – or stay with – the appropriate host.” VMware denies the remaining allegations of Paragraph 90.

91. In answer to Paragraph 91, VMware admits that the “vRealize Operations Manager 7.0 Help” publication (dated Feb. 22, 2019, available at <https://docs.vmware.com/en/vRealize-Operations-Manager/7.0/vrealize-operations-manager-70-help.pdf>) states: “The efficiency widget is the status of the efficiency-related alerts for the objects it is configured to monitor. Efficiency alerts in vRealize Operations Manager usually indicate that you can reclaim resources. You can create one or more efficiency widgets for objects that you add to your custom dashboards.” VMware denies the remaining allegations of Paragraph 91.

92. VMware denies the allegations of Paragraph 92.

93. VMware denies the allegations of Paragraph 93.

94. VMware denies the allegations of Paragraph 94.

F. VMware's Infringement Has Injured Densify

95. In answer to Paragraph 95, VMware admits that it has released vROps 7.0 and
7.5. VMware denies the remaining allegations of Paragraph 95.

96. VMware denies the allegations of Paragraph 96.

97. VMware denies the allegations of Paragraph 97.

CLAIM I

VMWARE'S ALLEGED INFRINGEMENT OF THE '687 PATENT

98. VMware repeats and incorporates by reference its responses to Paragraphs 1-97 as if fully stated here.

99. VMware denies the allegations of Paragraph 99.

100. VMware denies the allegations of Paragraph 100.

101. VMware denies the allegations of Paragraph 101.

102. VMware denies the allegations of Paragraph 102.

103. VMware denies the allegations of Paragraph 103.

104. In answer to Paragraph 104, VMware admits that the blog post available at <https://blogs.vmware.com/management/2018/09/self-driving-all-the-way-to-the-host-oh-yeah-host-based-placement.html> is on VMware's website and that it provides other websites and blogs relating to VMware's products. VMware denies the remaining allegations of Paragraph 104.

105. In answer to Paragraph 105, VMware admits that the publication available at <https://docs.vmware.com/en/vRealize-Operations-Manager/7.0/vrealize-operations-manager-70-help.pdf> is on VMware's website and that the public may access that and other publications relating to VMware's products. VMware denies the remaining allegations of Paragraph 105.

106. In answer to Paragraph 106, VMware admits that VMware is involved with industry events, including VMworld, seminars, and live and on-demand webcasts and webinars. VMware denies the remaining allegations of Paragraph 106.

107. VMware denies the allegations of Paragraph 107.

108. VMware denies the allegations of Paragraph 108.

109. VMware denies the allegations of Paragraph 109.

110. VMware denies the allegations of Paragraph 110.

111. VMware denies the allegations of Paragraph 111.

CLAIM II

VMWARE'S ALLEGED INFRINGEMENT OF THE '367 PATENT

112. VMware repeats and incorporates by reference its responses to Paragraphs 1-111 as if fully stated here.

113. VMware denies the allegations of Paragraph 113.

114. VMware denies the allegations of Paragraph 114.

115. VMware denies the allegations of Paragraph 115.

116. VMware denies the allegations of Paragraph 116.

117. VMware denies the allegations of Paragraph 117.

118. VMware denies the allegations of Paragraph 118.

119. VMware denies the allegations of Paragraph 119.

120. VMware denies the allegations of Paragraph 120.

121. VMware denies the allegations of Paragraph 121.

CLAIM III

ALLEGED UNFAIR COMPETITION IN VIOLATION OF THE LANHAM ACT, 15 U.S.C. § 1125(A)

122. VMware repeats and incorporates by reference its responses to Paragraphs 1-121 as if fully stated here.

123. In answer to Paragraph 123, VMware denies that Cirba has used “DENSIFY,” “DENSIFICATION,” or “DENSIFYING” as a trademark in interstate commerce in connection with any goods and services since at least as early as 2015. The remaining allegations of Paragraph 123 state legal conclusions, which do not require an admission or denial. But if a response is required, VMware denies them.

124. In answer to Paragraph 124, VMware denies that the terms “DENSIFY,” “DENSIFICATION,” and “DENSIFYING” are associated with a single source, including Cirba’s goods and services. VMware also denies that the terms “DENSIFY,” “DENSIFICATION,” and “DENSIFYING” have acquired secondary meaning as that phrase is used in trademark law. VMware also denies that the terms “DENSIFY,” “DENSIFICATION,” and “DENSIFYING” are distinctive as that term is used in trademark law. VMware lacks information sufficient to form a belief as to Cirba’s investments into promoting any trademarks, and therefore denies that allegation in Paragraph 124. The remaining allegations of Paragraph 124 state legal conclusions, which do not require an admission or denial. But if a response is required, VMware denies them.

125. VMware lacks information sufficient to form a belief as to the truth of the allegations of Paragraph 125 and therefore denies them.

126. VMware lacks information sufficient to form a belief as to the truth of the allegations of Paragraph 126 and therefore denies them.

127. In answer to Paragraph 127, VMware denies that it was aware that Cirba was using the terms “DENSIFY,” “DENSIFICATION,” and “DENSIFYING” as a trademark before Cirba filed the Complaint in this case. VMware admits that, after Cirba filed the Complaint in this case, VMware became aware that Cirba was claiming to use the terms “DENSIFY,” “DENSIFICATION,” and “DENSIFYING” as trademarks.

128. VMware lacks information sufficient to form a belief as to the truth of the allegations of Paragraph 128 and therefore denies them.

129. VMware lacks information sufficient to form a belief as to the truth of the allegations of Paragraph 129 and therefore denies them.

130. In answer to Paragraph 130, VMware admits that the filing date for Application Serial No. 88/078,131 is August 14, 2018, that the application was filed in the name of Cirba Inc., and that it remains pending in the U.S. Patent and Trademark Office. VMware lacks information sufficient to form a belief as to the truth of the remaining allegations of Paragraph 130 and therefore denies them.

131. VMware denies the allegations of Paragraph 131.

132. VMware denies the allegations of Paragraph 132.

133. VMware denies the allegations of Paragraph 133.

134. In answer to Paragraph 134, VMware denies that it is using any trademarks owned by Cirba and that its use of the terms “DENSIFY,” “DENSIFICATION,” and “DENSIFYING” is likely to cause confusion. VMware lacks information sufficient to form a belief as to the identity of Cirba’s customers, the market for its products, or whether most of Cirba’s customers also use VMware software and on that basis denies those allegations. VMware denies the remaining allegations of Paragraph 134.

135. In answer to Paragraph 135, VMware admits that it has one or more customers in Delaware. VMware denies the remaining allegations of Paragraph 135.

136. VMware denies the allegations of Paragraph 136.

137. VMware denies the allegations of Paragraph 137.

138. VMware denies the allegations of Paragraph 138.

139. VMware denies the allegations of Paragraph 139.

140. VMware denies the allegations of Paragraph 140.

CLAIM IV

ALLEGED DECEPTIVE TRADE PRACTICES UNDER DELAWARE LAW

141. VMware repeats and incorporates by reference its responses to Paragraphs 1-140 as if fully stated here.

142. VMware denies the allegations of Paragraph 142.

143. VMware denies the allegations of Paragraph 143.

144. VMware denies the allegations of Paragraph 144.

145. VMware denies the allegations of Paragraph 145.

146. VMware denies the allegations of Paragraph 146.

147. VMware denies the allegations of Paragraph 147.

148. VMware denies the allegations of Paragraph 148.

149. VMware denies the allegations of Paragraph 149.

150. VMware denies the allegations of Paragraph 150.

CLAIM V

ALLEGED COMMON LAW TRADEMARK INFRINGEMENT

151. VMware repeats and incorporates by reference its responses to Paragraphs 1-150 as if fully stated here.

152. VMware denies the allegations of Paragraph 152.

153. VMware denies the allegations of Paragraph 153.

154. VMware denies the allegations of Paragraph 154.

155. VMware denies the allegations of Paragraph 155.

156. VMware denies the allegations of Paragraph 156.

157. VMware denies the allegations of Paragraph 157.

158. VMware denies the allegations of Paragraph 158.

159. VMware denies the allegations of Paragraph 159.

PRAYER FOR RELIEF

160. VMware denies that Cirba has a right to any of the relief it seeks in its prayer for relief.

DEMAND FOR JURY TRIAL

161. The allegations of Paragraph 161 state legal conclusions, which do not require an admission or denial. But if a response is required, VMware denies them.

AFFIRMATIVE AND ADDITIONAL DEFENSES

Without assuming any burden that it would not otherwise bear, and without waiver, limitation, or prejudice to asserting additional defenses, VMware asserts the following affirmative and additional defenses:

DEFENSE NO. 1
(Failure to State a Claim)

162. Cirba has failed to state a claim on which relief can be granted.

DEFENSE NO. 2
(Non-Infringement of the '687 patent)

163. VMware has not infringed and is not infringing, directly or indirectly, literally or under the doctrine of equivalents, any valid and enforceable claim of the '687 patent.

DEFENSE NO. 3
(Prosecution History Estoppel/Prosecution Disclaimer as to the '687 patent)

164. Prosecution history estoppel or prosecution disclaimer preclude infringement of the claims of the '687 patent.

DEFENSE NO. 4
(Invalidity of the '687 patent)

165. The claims of the '687 patent are invalid for failing to meet one or more of the statutory and decisional conditions for patentability under Title 35 of the United States Code, including, without limitation, §§ 101, 102, 103, and 112.

DEFENSE NO. 5
(Non-Infringement of the '367 patent)

166. VMware has not infringed and is not infringing, directly or indirectly, literally or under the doctrine of equivalents, any valid and enforceable claim of the '367 patent.

DEFENSE NO. 6
(Prosecution History Estoppel / Prosecution Disclaimer as to the '367 patent)

167. Prosecution history estoppel and prosecution disclaimer preclude infringement of the claims of the '367 patent.

DEFENSE NO. 7
(Invalidity of the '367 patent)

168. The claims of the '367 patent are invalid for failing to meet one or more of the statutory and decisional conditions for patentability under Title 35 of the United States Code, including, without limitation, §§ 101, 102, 103, and 112.

DEFENSE NO. 8
(No Recovery of Costs)

169. Cirba's recovery of costs is limited under 35 U.S.C. § 288.

DEFENSE NO. 9
(Fair Use)

170. Cirba's trademark claims are barred, in whole or in part, by the doctrine of fair use. VMware does not use the terms "densify," "densifying," or "densification" as trademarks or to identify the source of its products. Rather it uses them in good-faith to describe a function of its technology.

DEFENSE NO. 10
(Acquiescence)

171. Cirba's trademark claims are barred, in whole or in part, by the doctrine of acquiescence/waiver because Cirba provided implied assurances to VMware that it would not assert trademark rights against VMware.

DEFENSE NO. 12
(Prior Use)

172. VMware commenced using the terms "densify," "densifying," or "densification" in connection with its vROps software before Cirba's claimed first use of those terms as trademarks.

DEFENSE NO. 11
(Laches/Time Limitation on Damages))

173. Cirba's claims for relief are barred, in whole or part, by laches or 35 U.S.C. § 286.

DEFENSE NO. 13
(Limitations on Cirba's Recovery)

174. This action is not an exceptional case in Cirba's favor, and Cirba may not recover, in whole or in part, its attorneys' fees and any costs under 35 U.S.C. § 285, 15 U.S.C. § 1117(a), or any other applicable law.

JURY DEMAND

175. Pursuant to Rule 38 of the Federal Rules of Civil Procedure and D. Del. LR 38.1, VMware demands a trial by jury on all issues upon which it may have a trial by jury.

VMWARE'S COUNTERCLAIMS

Defendant and Counter-Plaintiff VMware, Inc. (“VMware”), for its counterclaims against Plaintiffs and Counter-Defendants Cirba Inc. (d/b/a Densify) and Cirba IP, Inc. (collectively, “Cirba”), alleges as follows:

NATURE OF THE ACTION AND COUNTERCLAIMS

1. VMware counterclaims that Cirba Inc. has infringed and is infringing United States patents that VMware owns: U.S. Patent No. 8,875,266 (the “‘266 patent,” Ex. 1); U.S. Patent No. 10,069,752 (the “‘752 patent,” Ex. 2); U.S. Patent No. 8,336,049 (the “‘049 patent,” Ex. 3); and U.S. Patent No. 9,521,151 (the “‘151 patent,” Ex. 4). VMware also counterclaims for a declaratory judgment of non-infringement and invalidity as to Cirba’s ’687 and ’367 patents and a declaratory judgment of non-infringement, fair use, and no protectable rights in Cirba’s alleged trademarks from Cirba’s First Amended Complaint (D.I. 68, “Complaint”).

PARTIES

2. VMware is a corporation organized and existing under the laws of the State of Delaware and having its principal place of business in Palo Alto, California.

3. On information and belief, Cirba Inc. is a Canadian privately-owned corporation with a principal place of business in Markham, Ontario.

4. On information and belief, Cirba IP, Inc. is a Canadian privately-owned corporation and wholly-owned subsidiary of Cirba Inc.

JURISDICTION AND VENUE

5. This Court has jurisdiction over this action and VMware’s counterclaims under 28 U.S.C. §§ 1331, 1338(a), 2201, and 2202. Additionally, because Cirba’s Complaint sets forth state law claims involving questions of law and fact substantially related to one or more federal claims, this Court has jurisdiction under 28 U.S.C. § 1367.

6. By filing its Complaint in this judicial district, Cirba has consented to the personal jurisdiction of this Court for VMware's counterclaims.

7. Venue is proper in this judicial district pursuant to 28 U.S.C. §§ 1391, 1367, and 1400, and by filing its Complaint in this district, Cirba has consented to venue in this Court for VMware's counterclaims.

8. Cirba has sued VMware for infringement of the '687 and '367 patents, unfair competition under the Lanham Act, deceptive trade practices under Delaware statutory law, and trademark infringement under Delaware common law. VMware denies liability under any of Cirba's claims for relief in this action and denies that Cirba's patents are valid and that Cirba has any enforceable trademark rights. VMware also counterclaims against Cirba in this action, alleging Cirba Inc. has infringed and is infringing VMware's '266, '752, '049, and '151 patents. A substantial, actual, and continuing controversy therefore exists between Cirba and VMware as to their claims and counterclaims.

FACTUAL SUPPORT FOR VMWARE'S COUNTERCLAIMS

I. VMWARE IS THE INNOVATOR; CIRBA IS THE INFRINGER

A. VMware's History of Innovation and Cirba's History of Infringement

9. Founded in 1998, VMware pioneered the use of virtualization in the data center to consolidate computing workloads. Today, VMware employs over 24,000 people in 125 offices worldwide, works with over 75,000 partners, and serves over 500,000 customers. VMware has patented its innovations, holding over 2800 U.S. patents.

10. Virtualization technology abstracts a computer's hardware so that computer servers (or "host" computers) can run virtual computers called virtual machines ("VMs"). A VM is software that simulates a physical computer. Multiple VMs can be placed on the same host computer, and software applications run in these VMs rather than directly on the host.

11. As Cirba admits in its Complaint, VMware “is known for its innovation of the hypervisor—the layer of software residing between the operating system and the system hardware that enables virtualization.” (D.I. 68 ¶ 32.) VMware’s hypervisor, known originally as ESX and now ESXi, was just the beginning. The hypervisor provided a base platform (i) for VMware’s customers to run their data centers more efficiently by consolidating their workloads into VMs on fewer hosts and (ii) for VMware to build upon, enabling it to reach its position as the global leader in virtualization products, services, and innovation.

12. With its hypervisors running on servers in customers’ data centers, VMware also introduced software applications to manage the VMs running on top of the hypervisors. VMware’s VM management application, VirtualCenter (now called vCenter), provides a customer the ability to centrally view and manage all the VMs running across all of the hosts in the customer’s data center. Innovations in vCenter enabled customers, for example, to create, organize, and prioritize VMs and hosts as well as allocate VMs across the hosts to achieve more efficient and reliable performance.

13. One vCenter innovation is the Distributed Resource Scheduler (“DRS”), which VMware first released in June 2006 (“DRS 2006”)—more than two years before Cirba filed for the ’687 patent. DRS 2006 dynamically balanced the running of VMs across a collection of hosts logically organized in one or more groups called “clusters.” DRS 2006 continuously responded to changing conditions in a cluster, automatically moving VMs from one host to another to optimize the balance of workloads across the cluster’s computing resources. DRS 2006 applied rules for hardware compatibility, resource distribution, and organizational allocations to load balance across host computers to perform such optimization. DRS 2006

meets every limitation of at least claim 7 of Cirba’s asserted ’687 patent, thereby rendering it invalid.

14. VMware’s inventions related to balancing VMs among hosts include U.S. Patent No. 8,667,500 (the “Ji patent”). Filed in 2006, the Ji patent describes a system, like DRS, that manages the distribution of host computers’ resources to virtual machines. The Ji patent, alone or in combination with prior art disclosing either the use of software licensing as a business constraint or another business constraint, renders obvious at least claim 7 of Cirba’s asserted ’687 patent.

15. Cirba Inc. was founded in 1999, only a year after VMware, but has always trailed VMware as an innovator. While Cirba has attained only 9 U.S. patents over the last 20 years, VMware has attained over 2800 U.S. patents to date. Cirba Inc.’s products and services interface with VMware’s software to provide certain capabilities to customers hosting a VMware environment. But unlike VMware’s software, Cirba Inc.’s software for the VMware environment, first launched over a decade ago, never gained widespread traction among VMware’s customers. And now Cirba Inc.’s “on-premises” VM optimization business—its VMware use case—is in danger of becoming less relevant as the industry continues to move towards computer processing and applications in the “public cloud” where Cirba Inc.’s techniques for VM optimization are not applicable to its customers. While Cirba accuses VMware in this case of putting pressure on Cirba Inc.’s business by allegedly infringing Cirba’s ’687 and ’367 patents, Cirba Inc.’s dominant business challenges are the industry shift to the public cloud and its aging product offering for its on-premises customers, not VMware’s accused technology for on-premises applications.

16. Moreover, any success that Cirba Inc. has had in the past and has now can be attributed to its infringement of VMware’s patents. VMware asserts four of those patents in these counterclaims: the ’266 patent; the ’752 patent; the ’049 patent; and the ’151 patent.

17. For example, although Cirba alleges in its Complaint that software license compliance is a key Densify feature that VMware allegedly copied from Cirba and used in VMware’s accused vROps product (D.I. 68 ¶¶ 49, 56-58), Cirba Inc. has the history backwards. Software licensing compliance was first the subject of a VMware patent, the ’266 patent, entitled “System and methods for enforcing software license compliance with virtual machines” and claiming priority to a provisional patent application filed in May 2007. VMware filed this provisional application on software license compliance three months before Cirba filed its provisional application for its asserted ’687 patent. Cirba Inc. currently offers its software-as-a-service (“SaaS”) through the Densify.com website (“Densify.com SaaS service”), and Cirba Inc.’s “Software License Control” feature in the Densify.com SaaS service infringes VMware’s ’266 patent. First introduced into Cirba Inc.’s on-premises product in 2013, Cirba Inc.’s software license control feature in the Densify.com SaaS service, automated with “Proactive Automation,” uses VMware’s patented methods for software license compliance, as claimed in the ’266 patent. Moreover, VMware implemented VM-to-host affinity rules and their software license compliance use case in vCenter in 2010, before Cirba Inc. offered software license compliance.

18. The use of remote resource allocation analytics for distributed computer systems, such as the use of SaaS to remotely perform resource allocation analytics on a customer’s data centers, was another VMware innovation, as claimed in the ’752 patent. The ’752 patent claims priority to an August 2012 application. Cirba Inc., however, did not launch its Densify.com

SaaS service to offer remote analytics to customers until 2016, in an attempt to modernize its technology architecture. In the Densify.com SaaS architecture, a customer installs a Cirba Inc.-supplied software application referred to as the “Densify Connector” within each of its data centers. The Densify Connectors in the customer data centers collect data about computer systems in the data centers (such as servers running VMware’s ESXi hypervisor) and send the data to the customer’s “instance” running remotely on the Densify.com SaaS service. The Densify.com SaaS service then analyzes this data and sends the results of the analysis back to the customer’s data centers (through the Densify Connectors). For example, such resource allocation results include recommendations to relocate VMs to different hosts and/or to add or reduce CPU and memory resources for a VM (sometimes referred to as “right-sizing”). The Densify.com SaaS service infringes VMware’s ’752 patent.

19. VMware’s innovations also extended to provisioning VMs based on generating predictions of future VM utilization needs, i.e., predictive analysis. The ’049 patent, filed in 2009, describes how to predict future VM utilization, adjust such predictions based on current resource utilizations, and transmit instructions to provision VMs accordingly. As reflected, for example, by the ’049 patent, VMware was innovating around the use of predictive analysis to account for current and future VM utilization long before VMware introduced Predictive DRS in 2016, a technology that Cirba accuses of infringing its ’687 and ’367 patents (*see* D.I. 68 ¶¶ 54, 71, 89). And although Cirba touts itself in its marketing materials as the industry leader in predictive analysis to automate VM resource allocation using Cirba Inc.’s predictive analytics engine, Cirba Inc.’s predictive technology in the Densify.com SaaS service only provides resource predictions, adjustments, and instructions for provisioning VMs by infringing VMware’s ’049 patent.

20. In 2018, VMware acquired CloudHealth Technologies, a leading company in public cloud optimization. Among CloudHealth’s innovations was technology, claimed in the ’151 patent, to optimize public cloud infrastructure using operational and authorization policies. Cirba recently has attempted to expand into the public cloud space with its Densify.com SaaS service, purporting to optimize a customer’s cloud environment and automatically implement the optimization recommendations in the customer’s public cloud instance. CloudHealth, now part of VMware, is one of Cirba’s many competitors in the public cloud optimization space. Cirba Inc.’s policy-based cloud optimization feature in the Densify.com SaaS service infringes CloudHealth’s ’151 patent, now assigned to VMware.

21. As the history above reveals, Cirba Inc. has sustained and attempted to grow its business by offering various features, products, and services that infringe VMware’s patents—including Cirba Inc.’s Software License Control feature, its Densify.com SaaS architecture, its predictive analytics engine used to automate VM utilization recommendations, and its public cloud optimization functionality. By asserting its patent infringement counterclaims in this action, VMware seeks to end Cirba Inc.’s infringement.

B. The ’266 Patent and Cirba Inc.’s Infringing Technology

22. VMware is the owner of all right, title, and interest in and to the ’266 patent. The ’266 patent was issued on October 28, 2014, and is entitled “System and methods for enforcing software license compliance with virtual machines.” VMware attaches a copy of the ’266 patent as Exhibit 1. The claims of the ’266 patent cover methods and machine readable devices for enforcing software license compliance for software executed within a VM.

23. The ’266 patent addresses the technological difficulty of applying then “conventional licensing strategies,” such as “self-certifying software modules,” “inherent system[s] or platform identifier[s],” or “dongles and other hardware based add-in components”

to a virtualized environment. ('266 patent at 1:33-36.) In a system with virtual machines executing licensed software, “conventional” software license controls “become particularly complicated, if not rendered fundamentally impractical,” at least partially because “[v]irtualization decouples the application software from the underlying hardware platform.” ('266 patent at 1:66-67.) The '266 patent describes controlling software executed in a virtual environment by “implement[ing] a virtual policy enforcer layer” to “control access” to licensed software according to “access control policies.” ('266 patent at 6:53-57.)

24. Claim 1 recites a “method of securely controlling execution of a computer program within a virtual machine, . . . the virtual machine being configured for execution by way of system level virtualization software executing on a current host platform . . . comprising at least one central processing unit having access to a mass storage device.” The steps of the claimed method are:

- “executing a policy enforcer outside of the virtual machine,” which “access[es] policies stored by the mass storage device, the policies identifying one or more hardware platforms for which the virtual machine is authorized to execute, the policy enforcer determining whether the current host platform matches one of the hardware platforms identified by the policies”;
- “prohibiting the virtual machine from executing on the current host platform when the policies do not indicate that the virtual machine is permitted to execute on the current host platform”; and
- “permitting the virtual machine to execute on the current host platform when the policies indicate that the virtual machine is permitted to execute on the current host platform.”

25. The Densify.com SaaS service with the "Software License Control" feature (such as the hybrid tier) ("Densify.com SaaS service with SLC") practices at least claim 1 of the '266 patent at least when a customer's instance of the Densify.com SaaS service implements Software License Control in conjunction with Proactive Automation.¹ For example, the Densify.com SaaS service with SLC has software license compliance policies by labeling VMs and hosts as belonging to the same "license group." When the Densify.com SaaS service with SLC automates the rebalancing of VMs across hosts through its "Proactive Automation" feature, such rebalancing is performed only in accordance with the "license group" labels by only permitting VMs to be moved to hosts with the same license group labels.

26. The Densify.com SaaS service with SLC meets claim 1's "executing" step. It executes a policy enforcer (sometimes referred to as a "policy engine"²) and implements software license compliance using its core analytics engine that enforces control policies. For example, the Densify.com SaaS service with SLC and Proactive Automation accesses a customer's software license policies stored at the customer's data center using the Densify Connector³ and enables a customer to label or "tag" groups of VMs and hosts as belonging to a particular "license group." This tagging of VMs and hosts to match "Licensing Groups" creates and stores an affinity policy that Cirba Inc.'s policy enforcer applies.⁴ The table below, which

¹ See <https://www.densify.com/wp-content/uploads/densify-datasheet-software-license-control.pdf>, last accessed Aug. 19, 2019 (Ex. 5); <https://www.densify.com/service/software-license-control>, last accessed Aug. 20, 2019 (Ex. 6).

https://www.densify.com/docs/Content/Densify_Com/Using_Proactive_Automation.htm, last accessed Aug. 19, 2019 (Ex. 7).

² See, e.g., <https://www.densify.com/resources/densify-policy-engine> and embedded explanatory video, last accessed Aug. 19, 2019 (Exs. 8-9, respectively).

³ https://www.densify.com/docs/Content/Densify_Com/Using_Proactive_Automation.htm (Ex. 7).

⁴ See https://www.densify.com/docs/Content/Densify_Com/Using_Real-Time_Automation.htm, last accessed Aug. 19, 2019 (Ex. 10).

previously appeared on Cirba's website, shows the Licensing Group associated with an affinity policy for VM placement analysis:⁵

Attribute (category)	Description	Placement Analysis
VM Attributes		
Allocation Sync Group (Tags)	Name of the allocation synchronization group to which this VM belongs. Set this attribute to define groupings of systems that must maintain the same CPU (Allocation and Reservation) and Memory values when recommendations for upsizing and downsizing are suggested. See Reviewing Recommendations This feature is available only with Densify Hybrid Edition. for details. Supported for both VMware and IBM PowerVM.	N/A
Application Tier (Business)	Application tier name (e.g. web, application, database, etc).	Affinity
Business Applications (Business)	Name of the business services running on this VM. More than one value is allowed for this attribute.	Not Used
CPU Sizing Basis (Tags)	Set this attribute to define the benchmark to be used for CPU sizing recommendations. Supported for IBM PowerVM only, and LPARs with shared, uncapped CPUs. The following values are supported: <ul style="list-style-type: none"> ■ Virtual CPUs—The default. If you are using the default, then you do not need to set this attribute. ■ Reservation—Use "Reservation" in an environment where LPARs are sized based on Processor Units or "Entitlement". 	N/A
Department (Business)	Name of the department to which this VM belongs.	Affinity
Growth Profile (Profiles)	The growth profile name for modeling user-defined trends, for this VM.	Not used
High Availability Group (Tags)	The high availability group to which this system belongs. Set this attribute to define groupings for high availability systems. Supported for IBM PowerVM. For details on the applicable policy to keep VMs on separate managed systems when recommending placements, see Keep HA Members Apart .	Anti-Affinity
License Group (Licensing)	The license group of this system (e.g. Windows, SQL). This applies only to the software license control system.	Affinity
Load Balancing Group (Tags)	Name of the load balancing group to which this VM belongs.	Anti-Affinity

As Cirba Inc.'s documentation further states, the Densify.com SaaS service with SLC feature “tags VMs and hosts to minimize the number of software licenses required without impacting performance.”⁶ The license groups of the tagged VMs specify the claimed “hardware platforms” “for which the virtual machine is authorized to execute.” As discussed further below under the “permitting” step, when considering whether a particular VM should be automatically moved to a particular host during execution of the Densify.com SaaS service’s Proactive Automation

⁵ https://www.densify.com/docs/Content/Control_Console/Setting_Attributes.htm, last accessed July 11, 2019 (highlighting added).

⁶ https://www.densify.com/docs/Content/Densify_Com/Using_Real-Time_Automation.htm (Ex. 10).

feature, the policy enforcer will “determine[e] whether the current host platform matches one of the hardware platforms,” as claimed, by making sure the host has the same license group as the VM.

27. The Densify.com SaaS service with SLC meets claim 1’s “prohibiting” step. It prohibits the VM from executing on the current host platform when the accessed policies (e.g., the “license group” affinities that Cirba Inc. stores) indicate the VM is not authorized to execute on the current host by enforcing the license control policies. As Cirba Inc.’s documentation states, its Software License Control feature “restrict[s] placements of licensed VMs to the designated physical servers ensuring ongoing licensing compliance and efficiency.”⁷

28. The Densify.com SaaS service with SLC meets claim 1’s “permitting” step. When running its “Proactive Automation” feature combined with Software License Control, “action automation moves systems according to SLC recommendations.”⁸ In particular, when Cirba Inc.’s Proactive Automation feature recommends that a VM move from one host to another host (e.g., “the current host platform”) for rebalancing purposes, it “permit[s] the VM to execute on the current host platform” by transmitting an instruction (known as vMotion) to VMware’s vCenter platform requesting that the VM be moved and executed on the new host.⁹ By abiding by software license control policies when transmitting the vMotion instruction, Cirba Inc. thereby “[c]ontain[s] the licensed VMs on the licensed physical servers.”¹⁰

⁷ <https://www.densify.com/service/software-license-control> (Ex. 6).

⁸ https://www.densify.com/docs/Content/Densify_Com/Using_Proactive_Automation.htm (Ex. 7).

⁹ https://www.densify.com/docs/Content/Densify_Com/Action_Automation_Prerequisites.htm, last accessed Aug. 19, 2019 (Ex. 11) (“Enabling vMotion: When automating Densify rebalance recommendations, vMotion must be enabled on all the hosts in a cluster. This includes hosts, on which the VMs are currently running and the hosts to which the VMs may be moved.”)

¹⁰ <https://www.densify.com/service/software-license-control> (Ex. 6).

29. Accordingly, the Densify SaaS service directly infringes at least claim 1 of the '266 patent.

30. Cirba Inc. has known of the '266 patent at least since VMware filed these counterclaims.

31. Cirba Inc. has actively encouraged and instructed, is actively encouraging and instructing, and will continue to actively encourage and instruct its customers and users to implement and use the Densify.com SaaS service with SLC. Cirba Inc.'s data sheets and marketing materials on the Internet, cited above, memorialize this active encouragement and instruction. For example, its datasheet markets Software License Control to customers and users:

Densify's Software License Control capability reduces processor or core-based software licensing requirements by an average of 55%. Software License Control analytics optimize VM placements considering a target software license type in order to reduce the number of physical hosts that need to be licensed for that target software package . . . All of this translates into savings that can be realized through lower expenditures for renewals, deferral of new software license purchases, and reduced yearly maintenance. These savings can easily be in the millions of dollars, particularly on expensive operating system, database and middleware platforms.¹¹

Cirba Inc.'s website markets Software License Control, instructing customers and users on its use in a manner that practices at least claim 1 of the '266 patent as discussed above by enforcing software license compliance of VMs placed on hosts using a license control policy.¹²

32. In this action, Cirba Inc. has acknowledged that it directs and encourages its customers and users to implement Cirba Inc.'s Software License Control. Cirba claims in this action that Software License Control is a key feature and driver of Cirba Inc.'s business, one it

¹¹ <https://www.densify.com/wp-content/uploads/densify-datasheet-software-license-control.pdf> (Ex. 5).

¹² See https://www.densify.com/docs/Content/Densify_Com/Using_Proactive_Automation.htm. (Ex. 7.)

encourages and instructs customers to use. (*See, e.g.*, D.I. 68 ¶ 56.) For example, Cirba has stated in the litigation and publicly that it encouraged and instructed at least one global banking customer to implement Software License Control, which allegedly saved millions of dollars, and Cirba Inc. uses this customer's experience to encourage other customers to implement Cirba Inc.'s Software License Control feature.¹³

33. Cirba Inc.'s past, present, and future acts of encouraging and instructing customers to use the Software License Control feature has induced, induces, and will continue to induce their practice of at least claim 1 of the '266 patent.

C. The '752 Patent and Cirba Inc.'s Infringing Technology

34. VMware is the owner of all right, title, and interest in and to the '752 patent. The '752 patent was issued on September 4, 2018, and is entitled "Remote Service for Executing Resource Allocation Analyses for Distributed Computer Systems." VMware attaches a copy of the '752 patent as Exhibit 2. The claims of the '752 patent cover methods for performing remote resource allocation analyses on distributed computer systems.

35. The '752 patent describes technological improvements in the operation of distributed computer systems like data centers, for example, by determining remotely how to allocate resources in the data center more efficiently and transmitting the recommendations for resource allocation back to the data centers. The '752 patent explains that techniques to properly allocate resources of "distributed computer systems with resource-consuming clients, such as virtual machines (VMs), are important to ensure that the clients are operating at desired or target levels." ('752 patent at 1:17-20.) For example, if a VM "running on a host computer where CPU and memory are overextended to other VMs, that VM may not be able to [operate] at an

¹³ See <https://www.densify.com/resources/case-study-global-bank-oracle-license-savings>, last accessed Aug. 19, 2019 (Ex. 12).

acceptable level.” (’752 patent 1:20-23.) At the time the patent was filed, “[c]onventional resource allocation techniques execute[d] a resource allocation analysis for a single distributed computer system using at least the current utilizations of the various resources of the distributed computer system and the current requirements of the various components of the distributed resource system” to change the “resource allocation in the distributed computer system.” (’752 patent at 1:29-35.) That resource allocation analysis, however, “can be computationally intensive as the number of components in a distributed computer system increases[;];” accordingly, the number of components in a distributed computer system “is limited by the processing power of the device running the resource allocation analysis.” (’752 patent at 1:35-41.)

36. The claims of the ’752 patent are directed to technological solutions addressing the problems of the then-conventional resource allocation techniques, for example, using a “method for performing remote resource allocation analysis on distributed computer systems utiliz[ing] a snapshot of a target distributed computer system . . . which is transmitted to a remote resource allocation module so that a remote resource allocation analysis can be performed on the snapshot of the target distributed computer system.” (’752 patent at 1:49-57.) The ’752 patent improved on then-existing and conventional resource allocation techniques with the “use of a remote resource allocation module for performing resource allocation analyses [which] provides many advantages,” for example, “resource allocation analyses on very large distributed computer systems, i.e., with large inventories, can be performed since the remote resource allocation module can be supported by one or more powerful computer systems.” (’752 patent at 13:65-14:2.) And unlike the then-conventional solutions, the ’752 patent claims remote resource allocation techniques that “allow a distributed computer system to run alternate/experimental

resource allocation analyses in lieu of (or in addition to) the local resource allocation analyses.”
('752 patent at 14:2-5.)

37. Claim 1 recites a “method for performing remote resource allocation analyses on a plurality of distributed computer systems.” The steps of the claimed method are:

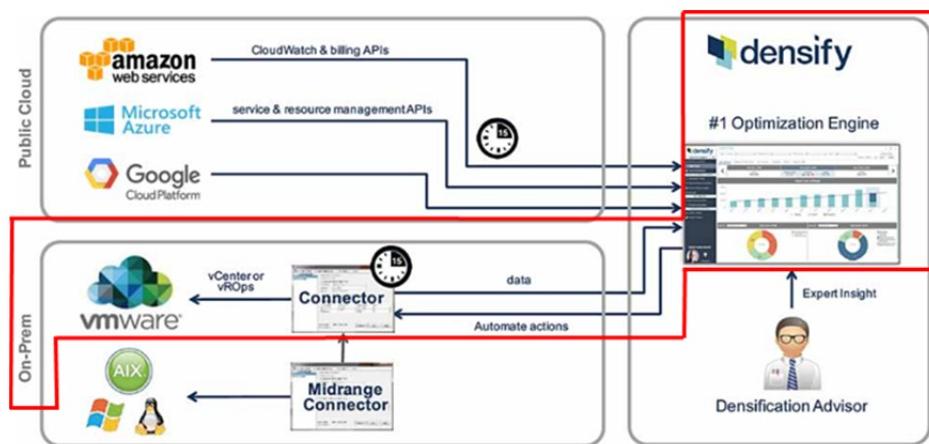
- “interfacing with the distributed computer systems at a remote resource allocation module that is located outside of the distributed computer systems, including receiving requests for access to the remote resource allocation module using authorization information”;
- “receiving a plurality of computer system snapshots from the distributed computer systems at the remote resource allocation module”;
- “performing remote resource allocation analyses on the computer system snapshots, each of the computer system snapshots including configurations and resource usage information of at least some computer system components”; and
- “transmitting results of the resource allocation analyses on the computer system snapshots from the remote resource allocation module to the distributed computer systems.”

38. Claim 7 recites “[t]he method of claim 1, wherein each of the computer system snapshots includes requirements of clients running on host computers in the distributed computer systems,” and claim 8 recites “[t]he method of claim 7, wherein the clients running on the host computers in the distributed computer systems include virtual machines.”

39. Claim 9, 15, and 16 of the '752 patent recite a “non-transitory computer readable storage medium containing program instructions for performing remote resource allocation analyses on a plurality of distributed computer systems, wherein execution of the program

instructions by one or more processors of a computer system causes the one or more processors to perform steps” corresponding to the steps of claims 1, 7, and 8, respectively.

40. Cirba Inc.’s Densify.com SaaS service practices at least claims 1, 7, 8, 9, 15, and 16 of the ’752 patent.¹⁴ Cirba Inc. claims: “The Densify service is based on market leading analytics delivered in a SaaS model. Key to the service is the fact that you won’t have to host, install, learn, manage and maintain our software.”¹⁵ Cirba Inc.’s own depiction of its SaaS analytics architecture applied to an on-premises VMware environment, annotated in red below, illustrates Cirba’s infringement of claims 1, 7, 8, 9, 15, and 16 graphically:



41. The Densify.com SaaS service meets the “interfacing” step of claims 1 and 9. A distributed computer system comprises the hosts in a customer’s VMware data center that are running vSphere as their hypervisor. As shown in the grey “On-Prem” box in the picture above, the Densify Connector is part of this “distributed computer system” and Cirba Inc. recommends that customers run the Densify Connector in a VM (e.g., running on top of vSphere’s ESXi

¹⁴ <https://www.densify.com/service/saas>, last accessed Aug. 19, 2019 (Ex. 13); <https://www.densify.com/company/news/releases/20160512-saas-based-analytics-densifying-de-risking-hybrid-cloud>, last accessed Aug. 19, 2019 (Ex. 14).

¹⁵ <https://www.densify.com/service/saas> (Ex. 13).

hypervisor in a host)¹⁶. The remote resource allocation module is the Densify.com SaaS service, which is remote from the customer’s VMware data center as shown by the grey “Densify” box in the picture above. The Densify.com SaaS service interfaces with the Densify Connector in the customer’s VMware data center, as illustrated by the “data” and “Automate actions” lines above. The Densify.com SaaS service receives requests for access using authorization information from the Densify Connector. For example, when configuring the Densify Connector, the Densify.com SaaS service receives username and password information for the Densify.com instance so the Densify Connector can connect to and thereby access Densify.com and upload information.¹⁷

42. The Densify.com SaaS service meets the “receiving” step of claims 1 and 9. A customer’s Densify.com instance receives computer system snapshots in the form of vCenter data relating to a data center’s VMs and hosts from the Densify Connector, which resides in the customer’s VMware data center and collects the snapshot data from vCenter. The Cirba Inc. webpage, “Data Collection for VMware Using the Connector,” evidence this step, describing in detail “automated, scheduled data collection from [a customer’s] vCenter Servers and transfer [o]f that data via HTTPS to Densify where data analysis is performed.”¹⁸

43. The Densify.com SaaS service meets the “performing” step of claims 1 and 9. A customer’s Densify.com instance performs the claimed resource allocation analyses using snapshot vCenter data relating to the data center VMs and hosts that was received from the Densify Connector. For example, Densify.com SaaS service analyzes workload and

¹⁶ See <https://www.densify.com/service/requirements>, last accessed Aug. 20, 2019 (Ex. 15).

¹⁷ See, e.g., *id.*

¹⁸ https://www.densify.com/docs/Content/Densify_Com/Data_Collection_VMware_Connector.htm, last accessed Aug. 19, 2019 (Ex. 16).

configuration data (related to VMs, hosts, and clusters) received from a Densify Connector.¹⁹

The Cirba Inc. data sheet entitled “How our SaaS model works” evidences this analysis, touting analytics that “identify capacity, risk and optimization and migration opportunities”.²⁰ Cirba has emphasized its analytics capability to optimize VM placements and perform capacity management for years, and its Densify.com SaaS service, which is not stored on premises, implements those analytics in a location remote from the data centers.

44. The Densify.com SaaS service meets the “transmitting” step of claims 1 and 9. Densify.com SaaS service transmits results back to the customer’s VMware data center through the Densify Connector in that data center. For example, Densify.com SaaS service transmits vSphere DRS rules (the results of the analyses) to vCenter via the Densify Connector to synchronize DRS rules with Cirba Inc.’s infrastructure control policies.²¹ Using Cirba Inc.’s Action Automation features, Densify.com also transmits results of the analyses in the form of instructions to vCenter (via the Densify Connector), for example, to automate Cirba Inc.’s recommended actions to (a) rebalance VMs (e.g., by requesting that vCenter execute recommended actions using vMotion) and/or (b) right-size VMs (e.g., by requesting that vCenter adjust VM CPU and memory usage through “hot add” or other VM configuration options provided by vCenter).²² Action Automation is depicted by the “Automate actions” line in the Densify SaaS architecture picture above.

¹⁹ See https://www.densify.com/docs/Content/Performing_Data_Collection.htm, last accessed Aug. 19, 2019 (Ex. 17).

²⁰ <https://www.densify.com/wp-content/uploads/densify-datasheet-saas-model.pdf>, last accessed Aug. 19, 2019 (Ex. 18); *see also* <https://www.densify.com/service/on-premises>, last accessed Aug. 20, 2019 (Ex. 19).

²¹ <https://www.densify.com/company/news/releases/20150827-vmware-vsphere-drs-software-defined-control-real-time-response>, last accessed Aug. 19, 2019 (Ex. 20).

²² See https://www.densify.com/docs/Content/Densify_Com/Using_Proactive_Automation.htm (Ex. 7).

45. The Densify.com SaaS service meets the additional limitation of claims 7 and 15 that “each of the computer system snapshots includes requirements of clients running on host computers in the distributed computer systems,” and the further limitation of claims 8 and 16 that “the clients running on the host computers in the distributed computer systems include virtual machine.” As described above, the accused clients running on host computers in the distributed computer systems are VMs running on hosts running vSphere as their hypervisor in VMware data centers, and the accused computer system snapshots include vCenter data, i.e., the requirements, of such VMs.

46. Accordingly, the Densify.com SaaS service directly infringes at least claims 1, 7, 8, 9, 15, and 16 of the ’752 patent.

47. Cirba Inc. has known of the ’752 patent at least since VMware filed these counterclaims.

48. Cirba Inc. has actively encouraged and instructed, is actively encouraging and instructing, and will continue to actively encourage and instruct its customers and users to use the Densify.com SaaS service to automatically optimize their VMware data centers in a manner that practices at least claims 1, 7, 8, 9, 15, and 16. Cirba Inc.’s data sheets and marketing materials on the Internet, cited above, memorialize this active encouragement and instruction. For example, the datasheet entitled “How our SaaS model works” instructs customers how to use the Densify.com SaaS service to collect data from, and automatically optimize, their VMware data centers in the manner described above.²³

49. Cirba Inc.’s past, present, and future acts of encouraging and instructing customers and users to use the Densify.com SaaS service to collect data from, and automatically

²³ <https://www.densify.com/wp-content/uploads/densify-datasheet-saas-model.pdf> (Ex. 18).

optimize, their VMware data centers has induced, induces, and will continue to induce their practice of at least claim 1, 7, 8, 9, 15, and 16 of the '752 patent.

D. The '049 Patent and Cirba Inc.'s Infringing Technology

50. VMware is the owner of all right, title, and interest in and to the '049 patent. The '049 patent was issued on December 18, 2012, and is entitled "Virtual machine utility computing method and system." VMware attaches a copy of the '049 patent as Exhibit 3. The claims of the '049 patent cover methods, systems, and non-transitory computer readable media for predicting computing resource utilization and allocating virtual machines to support changing resource requirements for applications over time.

51. The '049 patent addresses, for example, the technological difficulty of predicting demand for "business processes as services that are accessible over a network" to anticipate and accommodate how "use requirements will vary over time," including "spikes [in use requirements] that occur due to seasonal consumer trends." ('049 patent at 1:11-13, 1:31-33.) The patent teaches that "[m]any enterprises utilize service-oriented architectures (SOAs)," which "provide particular business processes as services that are accessible over a network," "to more efficiently implement their [line-of-business] LOB applications." ('049 patent at 1:9-13.) "Computing infrastructure service providers offer[ed] a web service that [was] structured to allow enterprises to rent computers" which they used to run "their LOB applications as outsourced web services." ('049 patent at 1:14-20.) Enterprises that relied on such computing infrastructure service providers, however, had to "rent and provision computing resources to accommodate peak utilization requirements," instead of only paying for resources on an "as-needed basis." ('049 patent at 1:23 and 1:26-33.)

52. The claims of the '049 patent provide automated predictive solutions to the problem of efficiently provisioning sufficient resources to accommodate spikes in use

requirements. The '049 patent claims "a virtual machine utility computing method and system that can predict demand and automatically adjust computing resource usage to accommodate changes in such predicted demand over time." ('049 patent at 1:36-40.) The claims require transmitting instructions relating to provisioning virtual machines in accordance with the adjusted provisions, which "enables an enterprise to match its computing costs on a 'per virtual machine' basis for the LOB application to changing demands for the application over time." ('049 patent at 1:46-51.)

53. Claim 16 of the '049 patent recites a "non-transitory computer readable storage medium having stored therein a computer program for allocating virtual machines to support changing computing resource requirements of an application over time," "wherein a computer system execut[es] the computer program." The steps carried out in executing the program are:

- "generating a prediction of future virtual machine utilization for the application based upon past resource utilization statistics";
- "receiving resource utilization statistics from a set of virtual machines currently supporting the application";
- "adjusting the prediction using the received resource utilization statistics"; and
- "transmitting instructions relating to provisioning virtual machines for the application in accordance with the adjusted prediction."

Claim 1 of the '049 patent is a method claim that recites the same four steps above as claim 16.

54. The Densify.com SaaS service practices at least claims 1 and 16 of the '049 patent, as seen, for example, through Cirba Inc.'s Control Console.²⁴ The Densify.com SaaS service is a program that uses predictive analytics in combination with its Proactive Automation

²⁴ https://www.densify.com/docs/Content/Control_Console/Working_with_the_Control_Console.htm, last accessed Aug. 20, 2019 (Ex. 21).

capabilities to send instructions to vCenter to migrate or move VMs to different hosts through vMotion or to right-size their CPUs or memories through vCenter's hot-add API or other VM configuration APIs.²⁵

55. The Densify.com SaaS service meets the “generating a prediction” step of claims 1 and 16. The Densify.com SaaS service performs predictions of future virtual machine utilization for the application based on past utilization statistics. For example, the Control Console displays resource utilization using a predictive model based on past utilization data to project demand.²⁶ As Cirba Inc.’s CTO Mr. Hillier states in the video “How Cirba Works with Andrew Hillier,”

This is a clear case of imbalance. I need to move VMs between these hosts to balance this out . . . [Cirba’s software] will sort all this out and it will do it predictively, so you can tell a policy, that may not have happened yet, that may be at high risk of happening if you look at the patterns of what is running on it . . . based on the VMs that are on this host, you have a high risk of that happening. . . . that may not have happened yet, we’re just saying the likelihood of it happening based on the model . . . this is a predictive model based on the past, so this might go back . . . through three months and build an envelope of what the utilization pattern looks like. . . . Our ‘today’ model is a predictive model.²⁷

56. The Densify.com SaaS service’s predictive capabilities are also shown in its time-slider function,²⁸ reproduced below:



²⁵ https://www.densify.com/docs/Content/Densify_Com/Using_Proactive_Automation.htm (Ex. 7).

²⁶ “How Cirba Works with Andrew Hillier,” <https://vimeo.com/146181163>, last accessed Aug. 19, 2019 (Ex. 22).

²⁷ “How Cirba Works with Andrew Hillier,” <https://vimeo.com/146181163> (Ex. 22) at 29:55.

²⁸ https://www.densify.com/docs/Content/Control_Console/Timeline_Slider.htm, last accessed Aug. 19, 2019 (Ex. 23).

“The Timeline Slider allows you to select a date in the past or future to see historical or projected data for that environment. The historical timeframe allows you to view the actual state of the environment in the past, while predictive timeframes model trending, growth and include bookings (inbound and outbound) to generate a forecasted view of the environment.”²⁹ “When the slider is moved into the future, the resulting predictive view is calculated using a linear extrapolation of historical data based on policy settings. A policy-specified minimum amount of historical data is needed to calculate predictive views so they are indicative of your environment's growth.”³⁰

57. The VMs analyzed by the Densify.com SaaS service are running applications. Furthermore, Cirba Inc.’s Control Console indicates that it is assessing resource utilization for applications, such as eBill payments, financial analytics, forecast planning, image archive, and resource planning.³¹ As early as a 2014 news release, Cirba Inc. emphasized the “application centric view” of its software, and showcased the display of capacity and risk on a per-application basis:

CiRBA’s new application and business centric views complement the unmatched infrastructure oriented visibility it has provided to customers for years with its award winning Control Console. . . . Providing application centric views of capacity requirements makes it far easier for IT teams and business stakeholders to understand and discuss the actual resource requirements and make reclamation decisions that previously would have been off the table,” said Andrew Hillier, co-founder and CTO of CiRBA.³²

58. The Densify.com SaaS service meets the “receiving resource utilization statistics” step of claims 1 and 16. For example, it receives VM resource utilization statistics from vCenter

²⁹ *Id.*

³⁰ *Id.*

³¹ <https://www.densify.com/company/news/releases/20140428-application-centric-control-it-infrastructure-supply-demand>, last accessed Aug. 19, 2019 (Ex. 24).

³² *Id.*

through the Densify Connector associated with a customer’s data center. “The Densify Connector is a self-contained, Windows-based application. It allows you to perform automated, scheduled data collection from your vCenter Servers and transfer that data via HTTPS to Densify where data analysis is performed.”³³ Cirba Inc.’s Control Console also receives resource utilization statistics, *i.e.*, what new workloads may be coming into the system, from its own Reservation Console, introduced in 2013.³⁴

59. The Densify.com SaaS service meets the “adjusting” step of claims 1 and 16. It adjusts a prediction using the received resource utilization statistics. For example, the Densify.com SaaS service adjusts (or “refreshes”) its prediction daily, after collecting information from vCenter:

The analysis refreshes are performed nightly and recommendations are generated and executed overnight based on policy settings, including software license optimization, if implemented. With Proactive Automation enabled, your environment should be optimized overnight and be ready to efficiently host workloads during the day.³⁵

As another Cirba Inc. document further explains, “[i]f a Control Console exists for the data, then the existing analytics are refreshed.”³⁶

60. In addition, when the Control Console is used in conjunction with the Reservation Console, the Densify.com SaaS service further adjusts its prediction, when leveraging the time slider, based on what new workloads may be coming into the system in the future.³⁷ As Mr. Hillier stated, “I can go forward in time, and if I go forward 30 days … I’ll see apps coming into

³³ https://www.densify.com/docs/Content/Densify_Com/Data_Collection_VMware_Connector.htm (Ex. 16).

³⁴ “How Cirba Works with Andrew Hillier,” <https://vimeo.com/146181163> (Ex. 22) at 43:47.

³⁵ https://www.densify.com/docs/Content/Densify_Com/Action_Automation_Overview.htm, last accessed Aug. 19, 2019 (Ex. 25).

³⁶ https://www.densify.com/docs/Content/Densify_Com/Using_Proactive_Automation.htm (Ex. 7).

³⁷ “How Cirba Works with Andrew Hillier,” <https://vimeo.com/146181163> (Ex. 22).

my environment. So this is where it is a predictive analysis. If I go forward in time, I'll see all sorts of inbound and outbound activity . . . this is not just a what-if, this is a living model of the environment. It's a completely predictive model of supply and demand.”³⁸

61. The Densify.com SaaS service meets the “transmitting” step of claims 1 and 16. It transmits instructions relating to provisioning of virtual machines for the application in accordance with the adjusted prediction. Specifically, as previously discussed, the Densify.com SaaS service transmits provisioning instructions to vCenter (i) to migrate or move VMs to different hosts through vMotion or (2) right-size their CPUs or memories through vCenter’s hot-add API or other VM configuration APIs. As Cirba Inc.’s documentation explains, “[w]hen proactive automation is enabled, Densify executes the following operations to generate recommendations and then execute[s] these recommendations on your vCenter Server.”³⁹ Cirba’s documentation further states that “the recommendations can be automatically pushed to third party systems such as VMware® vCenter™ and VMware® vCloud™ Director via integration with Densify.”⁴⁰

62. Accordingly, the Densify.com SaaS service directly infringes at least claims 1 and 16 of the ’049 patent.

63. Cirba Inc. has known of the ’049 patent at least since VMware filed these counterclaims.

64. Cirba Inc. has actively encouraged and instructed, is actively encouraging and instructing, and will continue to actively encourage and instruct its customers and users to

³⁸ *Id.* at 44:07.

³⁹ https://www.densify.com/docs/Content/Densify_Com/Using_Proactive_Automation.htm (Ex. 7).

⁴⁰ https://www.densify.com/docs/Content/Control_Console/Understanding_the_Concepts.htm, last accessed Aug. 19, 2019 (Ex. 26).

implement its predictive analytics and transmission of recommended actions to vCenter in a manner that practices at least claims 1 and 16 of the '049 patent. Cirba Inc.'s materials on the Internet memorialize this active encouragement and instruction. For example, its Control Console webpage encourages the use of Cirba Inc.'s predictive analytics: "Predictive analytics lets you look at your environments into the future, based on new supply and demand as well as historical trends."⁴¹ Cirba Inc.'s videos and documents cited above also tout the predictive analytics capabilities of the Densify.com SaaS service, encouraging and instructing Cirba Inc.'s customers and users to practice claims 1 and 16 of the '049 patent in the manner discussed above to achieve the benefits of Cirba Inc.'s predictive analytics and automation through the transmission of recommended actions to vCenter.

65. In this action Cirba has acknowledged that it directs and encourages its customer and users to implement predictive VM workload analytics in order to "automate and execute" recommendations. (*See* D.I. 68 ¶ 28; *see also id.* ¶¶ 26-27, 29.) Cirba claims in this action that predictive analytics and automated optimization are important features of the Densify.com SaaS service with which vROps is allegedly competing. (*See* D.I. 68 ¶¶ 26-28, 89.)

66. Cirba Inc.'s past, present, and future acts of encouraging and instructing its customers and users to use the predictive analytics of, and automation through the transmission of recommended actions to vCenter by, the Densify.com SaaS service has induced, induces, and will continue to induce its customers and users to practice at least claims 1 and 16 of the '049 patent.

⁴¹ https://www.densify.com/docs/Content/Control_Console/Working_with_the_Control_Console.htm (Ex. 21).

E. The '151 Patent and Cirba's Infringing Technology

67. VMware is the owner of all right, title, and interest in and to the '151 patent, acquired in connection with VMware's acquisition of CloudHealth Technologies. The '151 patent was issued on December 13, 2016, and is entitled "Automated and policy driven optimization of cloud infrastructure through delegated actions." VMware attaches a copy of the '151 patent as Exhibit 4. The claims of the '151 patent cover methods and systems for optimizing a cloud environment.

68. The '151 patent describes novel methods "to maintain a desired state" within a public cloud environment using software configured to "constantly monitor" the public cloud environment's "current state" and, as necessary, "regularly tune it to stay within desired operating conditions." ('151 patent at 1:25-28). When the patent was filed, public cloud computing "allow[ed] organizations to provision only what [infrastructure] they need[ed] for the period of time in which they need[ed] it." ('151 patent at 1:18-20.) While allowing rapid "provision" and "de-provision" of infrastructure, the then-conventional public cloud model "resulted in both an increased complexity and a more rapid pace of change within infrastructure that [] necessitated more active management to maintain desired states of cost, security, performance and availability." ('151 patent at 1:20-24.) The '151 patent claims systems and methods that provide a solution for automatically optimizing such a public cloud environment to achieve those goals.

69. Claim 1 of the '151 patent recites a "computer-implemented method for optimizing cloud environment through delegated actions using a cloud infrastructure optimization system, including at least a computer processor and a memory." The steps of the claimed method are:

- “gathering data representing operating conditions of a cloud environment using a monitoring system executing at the computer processor, which is operatively connected to the cloud environment over a network”;
- “determining a current state of the operating conditions of the cloud environment”;
- “storing, at the memory, at least one policy representing user desired operation of the cloud environment, and at least one user-defined policy to authorize a change to the cloud environment”;
- “evaluating, using a policy engine executing at the computer processor, whether the cloud environment should be changed to achieve a more desired state based on the current state of the operating conditions and the at least one policy set representing user desired operation of the cloud environment and the at least one user-defined policy to authorize a change to the operating conditions of the cloud environment”;
- “based on the evaluation, generating, using a recommendation engine executing at the computer processor, a recommended change to the operating conditions of the cloud environment to achieve at least one desired state consistent with the at least one user-defined policy”;
- “transmitting the recommended change to the cloud environment for changing the cloud environment from the current state to the desired state”;
- “performing at least one change to the cloud environment consistent with the recommended change”; and

- “determining at least one result of the at least one change to the cloud environment consistent with the at least one recommended change.”

70. The Densify.com SaaS service practices at least claim 1 of the ’151 patent when it performs its optimization analysis on a customer’s public cloud environment and pushes the changes to the customer automatically using Densify’s Public Cloud “Self-Optimizing Automation feature.”⁴²

71. The Densify.com SaaS service collects and analyzes a customer’s public cloud data.⁴³ The Densify.com SaaS service sets and stores user-configured public cloud optimization policies based on the data it collects and the customer’s preferences.⁴⁴ The Densify.com SaaS service uses those policies to recommend actions, i.e., changes, to the customer’s public cloud environment (e.g., one or more instances), which it labels “Cloud Recommendations,” and displays them in its user interface.⁴⁵ If the customer has enabled the Public Cloud “Self-Optimizing Automation feature” within Densify.com SaaS service, that service’s Terraform Forwarder transmits the recommended changes to a Densify Terraform template to implement

⁴² See https://www.densify.com/docs/Content/Densify_Com/Optimizing_Your_Public_Cloud.htm and two embedded explanatory videos, last accessed Aug. 19, 2019 (Exs. 27-29, respectively); https://www.densify.com/docs/Content/Densify_Com/Approving_Cloud_Recommendations.htm, last accessed Aug. 19, 2019 (Ex. 30) (“Self-Optimizing Automation process flow”); <https://www.densify.com/docs/Content/Resources/PDFs/Densify-Release-Notes.pdf>, last accessed Aug. 19, 2019 (Ex. 31) at 7-8, 13, 23.

⁴³ https://www.densify.com/docs/Content/Data_Collection_for_Public_Cloud_Systems/Data_Collection_for_Public_Cloud_Systems.htm, last accessed Aug. 19, 2019 (Ex. 32).

⁴⁴ https://www.densify.com/docs/Content/Densify_Com>Selecting_an_Optimization_Strategy.htm, last accessed July 17, 2019 (Ex. 33); *see also* <https://www.densify.com/docs/Content/Resources/PDFs/Densify-Whats-New.pdf>, last accessed Aug. 19, 2019 (Ex. 34) at 19-20 (“Approval Workflow for Self-Optimizing Automation”).

⁴⁵ https://www.densify.com/docs/Content/Densify_Com/Approving_Cloud_Recommendations.htm (Ex. 30).

the recommended changes in the customer’s public cloud environment.⁴⁶ After collecting sufficient data, the Densify.com SaaS service displays a current status of the customer’s cloud environment; and the current status reflects the results of implementing the Densify.com SaaS service’s changes to the customer’s public cloud environment.⁴⁷

72. The Densify.com SaaS service meets claim 1’s “gathering” step. It is a monitoring system that gathers a customer’s public cloud environment data, including data on its operating conditions, over the Internet. The Densify.com SaaS service includes a “Public Cloud Connection Wizard” to “configure a connection from Densify to [the customer’s] cloud-hosted environments.”⁴⁸ It collects various types of data, including the environment’s “configuration and workload data,”⁴⁹ such as the properties and configuration details of specific public cloud services,⁵⁰ and other “instance-specific details.”⁵¹ In a video, Andrew Hillier explains that Cirba “acquire[s] utilization data from all the major cloud providers.”⁵²

73. The Densify.com SaaS service meets claim 1’s “determining” step. It determines a current state of the operating conditions of a customer’s public cloud environment. The

⁴⁶ https://www.densify.com/docs/Content/Densify_Com/Enabling_Self-Aware_Self-Optimizing_Instances.htm, last accessed Aug. 19, 2019 (Ex. 35); *see also* <https://www.youtube.com/watch?v=pTxYwbC6GkY&t=134s>, last accessed Aug. 19, 2019 (Ex. 36).

⁴⁷ https://www.densify.com/docs/Content/Densify_Com/Optimizing_Your_Public_Cloud.htm (Ex. 27).

⁴⁸ https://www.densify.com/docs/Content/Data_Collection_for_Public_Cloud_Systems/Data_Collection_for_Public_Cloud_Systems.htm (Ex. 32).

⁴⁹ https://www.densify.com/docs/Content/Densify_Com/Using_the_Public_Cloud_Connection_Wizard.htm, last accessed Aug. 19, 2019 (Ex. 37).

⁵⁰ https://www.densify.com/docs/Content/Densify_Com/Viewing_the_Impact_Analysis_and_Recommendation_Report.htm, last accessed Aug. 19, 2019 (Ex. 38).

⁵¹ https://www.densify.com/docs/Content/Densify_Com/Understanding_the_Instance_Optimization_Details_Report.htm, last accessed Aug. 19, 2019 (Ex. 39).

⁵² “Public Cloud Option” video, available at https://www.densify.com/docs/Content/Densify_Com/Optimizing_Your_Public_Cloud.htm (Ex. 28) at 4:05.

Densify.com SaaS service collects and analyzes the public cloud environment's data to display the current data on the customer's public cloud environment within the various "dashboards" of the Densify.com SaaS service's user interface.⁵³ The Densify.com SaaS service also generates "cloud service optimization opportunity reports" with a current "Overall Status" assigned to the various instance types in the customer's public cloud environment.⁵⁴

74. The Densify.com SaaS service meets claim 1's "storing" step. It stores information about the desired operation of a customer's public cloud environment and also stores customer implementation policies identifying pre-approved types of changes for the Densify.com SaaS service to perform to the customer's public cloud environments. For example, a customer views and configures a variety of public cloud policies, such as policies applied to Amazon Web Services (AWS) for the Amazon public cloud, and selects available options for its public cloud environment with the Densify.com SaaS service's interface.⁵⁵ These are policies representing user desired operation of the cloud environment, as claimed. The customer can also select a public cloud Optimization Strategy, such as optimizing on instance type or on purchasing strategy in the customer's public cloud environment, using the Densify.com SaaS service.⁵⁶ These are also policies representing user desired operation of the cloud environment, as claimed. Additionally, the customer can configure "implementation method policies" to pre-approve the

⁵³ "Viewing the Cloud Optimization Dashboard" video, available at https://www.densify.com/docs/Content/Densify_Com/Optimizing_Your_Public_Cloud.htm (Ex. 29) at 1:15 and 1:47.

⁵⁴ https://www.densify.com/docs/Content/Densify_Com/Viewing_Cloud_Optimization_Reports.htm, last accessed Aug. 20, 2019 (Ex. 40).

⁵⁵ https://www.densify.com/docs/Content/Reporting_Framework/Viewing_Policy_Settings.htm, last accessed Aug. 19, 2019 (Ex. 41); https://www.densify.com/docs/Content/Densify_Com/Optimizing_Your_Public_Cloud.htm (Ex. 27) (describing cloud platform dashboards for AWS, Microsoft Azure, and Google Cloud, as well as the "Optimization Policies" tabs displaying policies applied to AWS, Azure, and Goggle cloud services "to produce recommendations").

⁵⁶ https://www.densify.com/docs/Content/Densify_Com>Selecting_an_Optimization_Strategy.htm (Ex. 33).

Densify.com SaaS service to deploy the pre-approved “Optimization Types (recommended actions)” in the customer’s public cloud environment.⁵⁷ The customer can “pre-approve any instance type recommendation” made by the Densify.com SaaS service.⁵⁸ More generally, the customer is able to select a variety of manual or automated approval options.⁵⁹ These are user-defined policies to authorize a change to the cloud environment, as claimed.

75. The Densify.com SaaS service meets claim 1’s “evaluating” step. It is a policy engine that evaluates based on the policies identified above and the current state of the operating conditions whether a customer’s public cloud environment should be changed.⁶⁰ For example, the Densify.com SaaS service evaluates a customer’s public cloud environment to find “Identified Risk” or “Savings Opportunity” or it may determine that the customer’s public cloud environment needs no change because it is currently an “[o]ptimal” environment or instance.⁶¹

76. The Densify.com SaaS service meets claim 1’s “generating” step. It is a “recommendation engine” that generates a recommended change in a customer’s public cloud environment that produces a desired state in that public cloud environment. For example, the Densify.com SaaS service creates an “Optimization Overview report” that “provides a summary of optimization opportunities and ways to mitigate risk for public cloud instances” within the customer’s public cloud environment.⁶² More specifically, the Densify.com SaaS service generates optimization recommendations for different instances in the public cloud environment,

⁵⁷ https://www.densify.com/docs/Content/Densify_Com/Approving_Cloud_Recommendations.htm (Ex. 30).

⁵⁸ *Id.*

⁵⁹ See <https://www.densify.com/docs/Content/Resources/PDFs/Densify-Whats-New.pdf> (Ex. 34) at 19-20 (“Approval Workflow for Self-Optimizing Automation”).

⁶⁰ <https://www.youtube.com/watch?v=-cH0pkxBU3E>, last accessed Aug. 19, 2019 (Ex. 42) (video in which A. Hiller describes the “policy engine” in the Densify SaaS service).

⁶¹ https://www.densify.com/docs/Content/Reporting_Framework/Viewing_the_Optimization_Overview_Report.htm, last accessed Aug. 19, 2019 (Ex. 43).

⁶² *Id.*

such as: to upsize an instance to a new and “more optimal instance family”; to downsize, or even terminate, an instance; and/or to modernize an instance to a newer instance available from the provider.⁶³ Customers can access “the data and policy settings” that the Densify.com SaaS service used to recommend a specific change.⁶⁴

77. The Densify.com SaaS service meets claim 1’s “transmitting step.” It transmits a recommended change in a customer’s public cloud environment. As part of the Automated Self-Optimizing Workflow, the Densify Terraform Forwarder transmits the recommended changes for the customer’s cloud environment to the Densify Terraform integration module (e.g., a Terraform map file with the Densify.com SaaS service’s analysis results and recommendations).”⁶⁵

78. The Densify.com SaaS service meets claim 1’s “performing” step. It performs changes to a customer’s public cloud environments consistent with its recommended changes. Through Densify’s Terraform integration module, the Densify.com SaaS service automatically updates instance sizes and types in accordance with the recommended changes.⁶⁶ In particular, if the user-defined policy authorizes such updating, the Densify.com SaaS service automates the

⁶³ https://www.densify.com/docs/Content/Densify_Com/Viewing_Cloud_Optimization_Reports.htm (Ex. 40) at Optimization Type Color-Coding Summary.

⁶⁴ https://www.densify.com/docs/Content/Densify_Com/Viewing_the_Impact_Analysis_and_Recommendation_Report.htm (Ex. 38) at Summary.

⁶⁵ https://www.densify.com/docs/Content/Densify_Com/Enabling_Self-Aware_Self-Optimizing_Instances.htm (Ex. 35); *see also* <https://github.com/densify-dev/terraform-null-optimization-as-code>, last accessed Aug. 19, 2019 (Ex. 44).

⁶⁶ https://www.densify.com/docs/Content/Densify_Com/Enabling_Self-Aware_Self-Optimizing_Instances.htm (Ex. 40) (*i.e.*, Step 3 in the Self-Aware Optimizing Workflow); *see also* <https://github.com/densify-dev/terraform-null-optimization-as-code> (Ex. 44).

execution of the Terraform Template, which then performs the change to the customer’s public cloud environment by transmitting instructions to the public cloud’s API interfaces.⁶⁷

79. The Densify.com SaaS service meets claim 1’s “determining” step. The Densify.com SaaS service determines the results of its changes to a customer’s public cloud platforms. After it implements a change, the Densify.com SaaS service displays a (now current) status of the customer’s cloud environment that reflects how that environment operates after the Densify.com SaaS service changed it.⁶⁸

80. Accordingly, the Densify.com SaaS service directly infringes at least claim 1 of the ’151 patent.

81. Cirba Inc. has known of the ’151 patent at least since VMware filed these counterclaims.

82. Cirba Inc. has actively encouraged and instructed, is actively encouraging and instructing, and will continue to actively encourage and instruct its customers and users to implement the automated public cloud optimization capabilities of the Densify.com SaaS service in a manner that practices at least claim 1 of the ’151 patent. Cirba Inc.’s materials on the Internet memorialize this active encouragement and instruction. For example, Cirba Inc. has many web pages encouraging and instructing its customers to optimize their public cloud environments and automate the optimization recommendations.⁶⁹ At least one web page

⁶⁷ https://www.densify.com/docs/Content/Densify_Com/Enabling_Self-Aware_Self-Optimizing_Instances.htm (Ex. 35); *see also* <https://www.youtube.com/watch?v=pTxYwbC6GkY&t=134s> (Ex. 36).

⁶⁸ https://www.densify.com/docs/Content/Densify_Com/Optimizing_Your_Public_Cloud.htm (Ex. 28).

⁶⁹ *See* https://www.densify.com/docs/Content/Densify_Com/Optimizing_Your_Public_Cloud.htm (Ex. 27); https://www.densify.com/docs/Content/Densify_Com/Approving_Cloud_Recommendations.htm (Ex. 30); https://www.densify.com/docs/Content/Densify_Com/Enabling_Self-Aware_Self-Optimizing_Instances.htm (Ex. 35).

includes videos teaching customer to optimize their public cloud environments with the Densify.com SaaS service and discussing the expected benefits of implementing the public cloud optimization recommendations, such as cost savings.⁷⁰ Cirba Inc.’s videos and documents cited above encourage and instruct Cirba Inc.’s customers and users to practice claim 1 of the ’151 patent in the manner discussed above to achieve the benefits of the Densify.com SaaS service’s automated public cloud optimization features.

83. Cirba Inc.’s past, present, and future acts of encouraging and instructing its customers and users to use these features in the Densify.com SaaS service has induced, induces, and will continue to induce its customers and users to practice at least claim 1 of the ’151 patent.

II. CIRBA’S PURPORTED TRADEMARK RIGHTS

A. Cirba Has No Protectable Rights in Densify, Densification, or Densifying

84. Before 2017, when they launched a “branding project under the name ‘Densify’” (D.I. 68 ¶ 129), Plaintiffs operated under the trade name Cirba. On August 14, 2018, Cirba filed an application with the USPTO to register DENSIFY as a trademark, claiming July 2017 as its first use date. Cirba has not filed any application with the United States Patent & Trademark office (“USPTO”) to register “densification” or “densifying” as a trademark.

85. Cirba did not make up these terms. “Densify” is a common English word—a verb—defined in dictionaries to mean “to make denser; compress” and “to make or become denser.”⁷¹ “Densifying” and “densification” are defined as variants of “densify.”⁷² Because densify, densification, and densifying aptly describe functions of Cirba’s technology, and

⁷⁰ https://www.densify.com/docs/Content/Reporting_Framework/Viewing_the_Optimization_Overview_Report.htm (Ex. 43).

⁷¹ https://www.merriam-webster.com/dictionary/densify?utm_campaign=sd&utm_medium=serp&utm_source=jsonld, last accessed Aug. 19, 2019 (Ex. 45); <https://www.collinsdictionary.com/us/dictionary/english/ densify>, last accessed Aug. 19, 2019 (Ex. 46).

⁷² *Id.*

because Cirba cannot establish secondary meaning in any of these terms, it has no protectable rights in them.

86. For example, in an April 28, 2015 press release, Cirba claims that its “predictive analytics *densify* and reduce risk in KVM environments by safely optimizing VM hosting, placement and sizing decisions.”⁷³

87. Similarly, a June 15, 2015 Cirba press release reads in relevant part:

Most organizations routinely over-provision hardware and software for virtualized IT infrastructure to hedge against operational risk. This practice is not only costly, but is also often ineffective at reducing performance issues. Another approach, one that focuses on allocating resources and placing VMs in a way that that both meets workload requirements while *densifying* infrastructure, has successfully saved organizations million in capital and operating costs, while reducing performance issues and volatility.⁷⁴

88. This press release also touts one of its executive’s “experience in ensuring *densification*, automation and visibility by leveraging policy-based analytics to balance application demand with infrastructure supply.”⁷⁵ And in a press release from March 2016, Cirba explains that its software “dovetails workloads in a way that is analogous to the game of Tetris®, to safely *densify* infrastructure by an average of 48 percent in virtual and cloud hosting environments.”⁷⁶

89. In addition, the terms “densify,” “densification,” and “densifying” (the “Asserted Marks”) are merely descriptive of Cirba’s Optimization Engine tools because one of the ways by

⁷³ Business Wire, Cirba Announces Software-Defined Control for KVM and OpenStack® - Based Private Clouds; Cirba’s analytics densify infrastructure and reduce operational risk through intelligent VM routing and placements, Lexis Advance, (dated Apr. 28, 2015) (Ex. 47 (emphasis added)).

⁷⁴ <https://www.densify.com/company/news/releases/20150615-fidelity-national-information-services-it-infrastructure-densification>, last accessed Aug. 19, 2019 (Ex. 48 (emphasis added)).

⁷⁵ *Id.* (emphasis added)

⁷⁶ Business Wire, Cirba and Arista Provide Network Aware Software-Defined Infrastructure Control, Lexis Advance (dated Mar. 1, 2016) (Ex. 49 (emphasis added)).

which the Optimization Engine optimizes virtual environments is by “increas[ing] the *density* of VMs.” (D.I. 68 ¶ 30 (emphasis added).) In other words, the Optimization Engine *densifies* VMs.

90. On information and belief, densification is a significant function of Cirba’s Optimization Engine, as densification is touted throughout Cirba’s marketing materials. For example, Cirba’s website boasts that its tools “[r]educ[e] the number of processors/hosts requiring licenses by maximizing VM *density*,”⁷⁷ and “perform[] deep, 24x7 predictive analysis of workload patterns to uncover opportunities to optimize workload *density*, while at the same time reducing contention and operational risk.”⁷⁸ Cirba explains that it is *critical to optimization* that historical workload patterns are analyzed to predict future behavior, because “[i]f you don’t know what a workload will do, you can’t drive higher *density* without incurring lots of risk.”⁷⁹

91. Based upon Cirba’s own use of “densify,” “densification,” and “densifying” in its press releases and marketing materials, the Asserted Marks are merely descriptive of a function of the technology that Cirba promotes with the terms “densify,” “densification,” and “densifying.” Because these are merely descriptive terms, they are not protectable absent a showing of secondary meaning. On information and belief, these terms have not acquired secondary meaning and consumers do not understand them to identify the source of Cirba’s products or services.

B. Cirba Does Not Use “Densifying” and “Densification” as Trademarks

92. Cirba uses “densifying” and “densification” to explain what its software does, not as trademarks. For example, it uses “densifying” in the phrase “Densifying Your Environment”

⁷⁷ <https://www.densify.com/service/software-license-control> (Ex. 6 (emphasis added)).

⁷⁸ <https://www.densify.com/service/how-we-optimize>, last accessed Aug. 20, 2019 (Ex. 50 (emphasis added)).

⁷⁹ <https://www.densify.com/service/optimize>, last accessed Aug. 19, 2019 (Ex. 51 (emphasis added)).

to describe a category of reports available on its dashboard.”⁸⁰ On information and belief, a customer would not understand the gerund in this phrase as identifying the source of Cirba’s software, particularly when similar descriptive gerunds appear in connection with other reports on the list, such as “De-Risking Your Environment” and “Viewing Advisor Insight.”⁸¹

93. Similarly, Cirba refers on its partner page to how its experts “assess customer environments for *densification*, cost reduction and transformation to public cloud,”⁸² and elsewhere explains how customers can “identify *densification* opportunities,”⁸³ review reports that “give[] you an analysis summary of the risk, *densification* and demand within your virtual on-premise environments,”⁸⁴ and view “*densification* opportunities.”⁸⁵ The fact that Cirba uses the term “densification” as part of the phrase “Densification Advisors” to describe its customer service advisors⁸⁶ likewise does not show use as a trademark for its software. At most, it is a descriptive term for its employees who provide advice on the use of its software.

94. Cirba makes no trademark claim for “densifying” or “densification” on its website, although it does for Densify.⁸⁷ In addition, on information and belief, Cirba has not used a ™ symbol following the terms “densifying” or “densification” despite doing so in

⁸⁰ https://www.densify.com/docs/Content/Reporting_Framework/Densifying_Your_Environment.htm, last accessed Aug. 20, 2019 (Ex. 52).

⁸¹ *Id.*

⁸² <https://www.densify.com/partners/onboarding>, last accessed Aug. 19, 2019 (Ex. 53 (emphasis added)).

⁸³ https://www.densify.com/docs/Content/Use_Cases/FAQs.htm, last accessed Aug. 19, 2019 (Ex. 54 (emphasis added).)

⁸⁴ https://www.densify.com/docs/Content/Reporting_Framework/Viewing_the_Optimization_Overview_Report__Virtual_.htm, last accessed Aug. 19, 2019 (Ex. 55 (emphasis added)).

⁸⁵ https://www.densify.com/docs/Content/Densify_Com/Viewing_the_Executive_Summary.htm, last accessed Aug. 19, 2019 (Ex. 56 (emphasis added)).

⁸⁶ <https://www.densify.com/partners/onboarding> (Ex. 53).

⁸⁷ <https://www.densify.com/legal/privacy-policy>, last accessed Aug. 20, 2019 (Ex. 57).

connection with Densify. Finally, Cirba has not filed an application with the USPTO to register “densifying” or “densification” as a trademark.

III. VMWARE’S USE OF DESCRIPTIVE TERMS

A. VMware Uses the Asserted Marks Merely to Describe its Own Technology and Not as Trademarks

95. VMware’s use of the terms “densify,” “densification,” and “densifying” is done in good faith. The terms are used in their ordinary descriptive senses in text in documents that make it very clear that the products originate with VMware, not Cirba. Nothing in VMware’s manner of using these terms suggests an attempt to create a false association with Cirba, nor to confuse customers as to the source of VMware’s products.

96. Because of the nature of VMware’s technology, it must communicate complex ideas succinctly and clearly. As a transitive verb, “densify” conveys a message more succinctly than “to make denser” or “to increase density,” which may not suit a sentence or expression. So too for the present participle “densifying” and the noun “densification.” In fact, VMware has used these terms merely descriptively, and not as a trademark, in the six instances to which Cirba cites in its Complaint—two YouTube videos, one datasheet, and three blog entries.

97. For example, Complaint Exhibit 14 is a datasheet entitled “Self-Driving Operations by VMware vRealize Operations.” VMware uses the terms “densify” and “densification” a single time each, both in a non-source identifying descriptive fashion as follows: “Automate workload balancing to reduce software license costs, optimize based on performance tiers, densify clusters, or enforce compliance. Reduce cost and capacity risk with real-time, predictive capacity analytics delivering optimal densification and proactive planning.” This language is part of a larger paragraph of text, and neither term is capitalized, bolded, nor otherwise offset from adjacent text. The VMware house mark with a registration symbol is

prominently featured in the footer of the one-page datasheet, along with a VMware copyright notice.

98. Complaint Exhibit 34 is a YouTube video entitled “VMware vRealize Operations, Workload Optimization.” VMware uses “densify” and its variants in a non-source identifying fashion throughout the video to describe how the Workload Optimization feature of vROps densifies clusters of hosts. Each use is part of a longer descriptive phrase (whether spoken or written), and the two written uses follow the capitalization style for the phrases as a whole, namely, “Densify to Repurpose Hosts” and “Execute Workload Optimization to Densify.” The terms are not bolded or otherwise offset from adjacent text. The opening slide prominently features the VMware house mark with a registration symbol. The VMware house mark also appears in the footer of both slides where “Densify” is used, and the video closes with a slide prominently featuring the VMware house mark, followed by a slide that reads vmware.com and includes a VMware copyright notice.

99. Complaint Exhibits 26-28 are blog entries. In each one a VMware employee used the term “densify” or “densification” in a single non-source identifying instance. In each instance, the language is part of a larger paragraph of text and the term is not capitalized, bolded, or otherwise offset from adjacent text. The top of the webpage on which the blog is published displays the VMware house mark with a registration symbol, next to the term “BLOGS,” followed by the subheading “VMware Cloud Management.”⁸⁸

⁸⁸ Cirba attached unformatted copies of the blog entries at Complaint Exhibits 26-28 that omit VMware’s trademarks. For Complaint Exhibit 26, Cirba even cut off the end of the article. VMware attaches complete versions of these webpages at Exhibits 58 – 60, respectively. See <https://blogs.vmware.com/management/2018/10/upgrade-to-self-driving-operations-at-up-to-65-off.html> (Ex. 58); <https://blogs.vmware.com/management/2018/11/cloud-management-platform-cmp-intelligent-provisioning-and-optimization.html> (Ex. 59); <https://blogs.vmware.com/>

100. Finally, Complaint Exhibit 36 is a nearly hour-long YouTube video entitled “Top Reasons to Upgrade to vRealize Operations 7.0.” VMware uses the terms “densification” and “Densify” a single time each. The footer of the opening slide features the VMware house mark with a registration symbol, as well as a VMware copyright notice. The closing slide provides a link to and an excerpt from vrealize.vmware.com, which itself displays the VMware house mark.

101. In none of these instances, nor in any instance where VMware has publicly used these terms, has the relevant term been used as a source identifier. In each instance, the term is used to describe VMware’s technology and lacks the prominence necessary to function as a trademark, especially when the document or video is viewed as a whole.

102. Finally, and in the alternative, even if VMware’s use of “densify,” “densification,” and “densifying” does not constitute fair use, that use is still not likely to cause confusion, or to cause mistake, or to deceive as to the affiliation, connection, or association of VMware or its products with Cirba or its products, or vice versa. Each of VMware’s uses of the terms “densify,” “densification,” and “densifying” is found within a technical document or video that a customer would only access after understanding that he or she is viewing documentation from VMware. Moreover, VMware uses the terms “densify,” “densification,” and “densifying” in documents that are marked with VMware’s VMWARE house mark. In addition, both parties’ customers are highly sophisticated. A decision to use either company’s technology usually represents a significant institutional investment, so purchasing decisions are made thoughtfully and carefully. VMware’s use of the terms “densify,” “densification,” and “densifying,” whether trademark use or not, does not constitute infringement of any rights that Cirba may have in the Asserted Marks.

management/2018/09/start-running-a-self-driving-datacenter-vrealize-operations-7-0-workload-optimization.html (Ex. 60).

COUNTERCLAIMS

**COUNTERCLAIM 1
(Infringement of the '266 Patent)
(Against Cirba Inc.)**

103. VMware re-alleges and incorporates by reference each allegation stated in paragraphs 1 through 102 above as if fully stated here.

104. Cirba Inc. has infringed, infringes, and will continue to infringe one or more claims of the '266 patent, including at least claim 1, literally or under the doctrine of equivalents, under 35 U.S.C. § 271(a) by making, using, selling, and/or offering for sale in the United States and/or importing into the United States at least the Densify.com SaaS service (with the Software License Control feature).

105. Cirba Inc. has known of the '266 patent at least as of the filing date of these counterclaims.

106. Cirba Inc. actively induces as of the filing date of these counterclaims and will continue to actively induce infringement of one or more claims of the '266 patent by its customers and users, including at least claim 1, under 35 U.S.C. § 271(b), by actively encouraging and instructing and continuing to actively encourage and instruct Cirba Inc.'s customers and users to practice, as described above, the claimed methods at least through the Densify.com SaaS service, including the Software License Control feature.

107. As a result of Cirba Inc.'s infringement of the '266 patent, VMware has suffered damages and will continue to suffer damages, including damages awardable under 35 U.S.C. §§ 284 and 285.

108. Cirba Inc.'s infringing conduct has caused and is causing irreparable harm to VMware for which VMware has no adequate remedy at law, and such irreparable harm will continue unless and until Cirba Inc. is enjoined by the Court.

COUNTERCLAIM 2
(Infringement of the '752 Patent)
(Against Cirba Inc.)

109. VMware re-alleges and incorporates by reference each allegation stated in paragraphs 1 through 102 above as if fully stated here.

110. Cirba Inc. has infringed, infringes, and will continue to infringe one or more claims of the '752 patent, including at least claims 1, 7, 8, 9, 15, and 16, literally or under the doctrine of equivalents, under 35 U.S.C. § 271(a) by making, using, selling, and/or offering for sale in the United States and/or importing into the United States at least the Densify.com SaaS service.

111. Cirba Inc. has known of the '752 patent at least as of the filing date of these counterclaims.

112. Cirba Inc. actively induces as of the filing date of these counterclaims and will continue to actively induce infringement of one or more claims of the '752 patent, including at least claims 1, 7, 8, 9, 15, and 16, under 35 U.S.C. § 271(b), by actively encouraging and instructing and continuing to actively encourage and instruct Cirba Inc.'s customers and users to use at least the Densify.com SaaS service with its Action Automation feature to practice the claims.

113. As a result of Cirba Inc.'s infringement of the '752 patent, VMware has suffered damages and will continue to suffer damages, including damages awardable under 35 U.S.C. §§ 284 and 285.

114. Cirba Inc.'s infringing conduct has caused and is causing irreparable harm to VMware for which VMware has no adequate remedy at law, and such irreparable harm will continue unless and until Cirba Inc. is enjoined by the Court.

COUNTERCLAIM 3
(Infringement of the '049 Patent)
(Against Cirba Inc.)

115. VMware re-alleges and incorporates by reference each allegation stated in paragraphs 1 through 102 above as if fully stated here.

116. Cirba Inc. has infringed, infringes, and will continue to infringe one or more claims of the '049 patent, including at least claims 1 and 16, literally or under the doctrine of equivalents, under 35 U.S.C. § 271(a) by making, using, selling, and/or offering for sale in the United States and/or importing into the United States at least the Densify.com SaaS service.

117. Cirba Inc. has known of the '049 patent at least as of the filing date of these counterclaims.

118. Cirba Inc. actively induces as of the filing date of these counterclaims and will continue to actively induce infringement of one or more claims of the '049 patent, including at least claims 1 and 16, under 35 U.S.C. § 271(b), by actively encouraging and instructing and continuing to actively encourage and instruct Densify's customers and users to use at least the Densify.com SaaS service's predictive VM optimization and capacity management features and their automation by transmission of recommended actions to vCenter to practice the claims.

119. As a result of Cirba Inc.'s infringement of the '049 patent, VMware has suffered damages and will continue to suffer damages, including damages awardable under 35 U.S.C. §§ 284 and 285.

120. Cirba Inc.'s infringing conduct has caused and is causing irreparable harm to VMware for which VMware has no adequate remedy at law, and such irreparable harm will continue unless and until Cirba Inc. is enjoined by the Court.

COUNTERCLAIM 4
(Infringement of the '151 Patent)
(Against Cirba Inc.)

121. VMware re-alleges and incorporates by reference each allegation stated in paragraphs 1 through 102 above as if fully stated here.

122. Cirba Inc. has infringed, infringes, and will continue to infringe one or more claims of the '151 patent, including at least claim 1, literally or under the doctrine of equivalents, under 35 U.S.C. § 271(a) by making, using, selling, and/or offering for sale in the United States and/or importing into the United States at least the Densify.com SaaS service.

123. Cirba Inc. has known of the '151 patent at least as of the filing date of these counterclaims.

124. Cirba Inc. actively induces as of the filing date of these counterclaims and will continue to actively induce infringement of one or more claims of the '151 patent, including at least claim 1, under 35 U.S.C. § 271(b), by actively encouraging and instructing and continuing to actively encourage and instruct Densify's customers and users to use at least the Densify.com SaaS service's automated public cloud optimization features to practice the claims.

125. As a result of Cirba Inc.'s infringement of the '151 patent, VMware has suffered damages and will continue to suffer damages, including damages awardable under 35 U.S.C. §§ 284 and 285.

126. Cirba Inc.'s infringing conduct has caused and is causing irreparable harm to VMware for which VMware has no adequate remedy at law, and such irreparable harm will continue unless and until Cirba Inc. is enjoined by the Court.

COUNTERCLAIM 5
(Declaratory Judgment of Non-Infringement of the '687 Patent)
(Against Cirba Inc. and Cirba IP, Inc.)

127. VMware re-alleges and incorporates by reference each allegation stated in paragraphs 1 through 102 above as if fully stated here.

128. VMware has not infringed and does not infringe any valid and/or enforceable claim of the '687 patent, directly or indirectly, literally or under the doctrine of equivalents. For example, VMware's vROps product cannot infringe at least asserted claim 7 of the '687 patent at least because vROps does not create or manage VM-to-VM affinity rules and therefore cannot satisfy the claim limitation "evaluating each virtual guest against . . . other guests." Moreover, DRS 2006 anticipates at least asserted claim 7 of the '687 patent for at least the detailed reasons stated in Dr. Nieh's June 7 expert declaration (D.I. 50), and VMware cannot infringe an invalid claim.

129. To resolve the legal and factual questions raised by Cirba and to afford relief from the uncertainty and controversy that Cirba's allegations have created, VMware seeks a declaratory judgment that it does not infringe the '687 patent.

COUNTERCLAIM 6
(Declaratory Judgment of Invalidity of the '687 Patent)
(Against Cirba Inc. and Cirba IP, Inc.)

130. VMware re-alleges and incorporates by reference each allegation stated in paragraphs 1 through 102 above as if fully stated here.

131. The claims of the '687 patent are invalid for failing to meet one or more of the statutory and decisional conditions for patentability under Title 35 of the United States Code, including, without limitation, §§ 101, 102, 103, and/or 112. For example, VirtualCenter 2 anticipates at least asserted claim 7 of the '687 patent for at least the detailed reasons stated in Dr. Nieh's June 7 expert declaration (D.I. 50).

132. To resolve the legal and factual questions raised by Cirba and to afford relief from the uncertainty and controversy that Cirba's allegations have created, VMware seeks a declaratory judgment that the '687 patent is invalid.

COUNTERCLAIM 7
(Declaratory Judgment of Non-Infringement of the '367 Patent)
(Against Cirba Inc. and Cirba IP, Inc.)

133. VMware re-alleges and incorporates by reference each allegation stated in paragraphs 1 through 102 above as if fully stated here.

134. VMware has not infringed and does not infringe any valid and/or enforceable claim of the '367 patent, directly or indirectly, literally or under the doctrine of equivalents. For example, VMware does not use the accused "at least one operational policy" to "comput[e] at least one score . . . based on . . . the at least one operational policy" that is used to "display[] an indicator for at least one of the plurality of computing entities in a graphical representation based on the corresponding score." Cirba's Complaint also has not identified an operational policy that vROps obtains and uses in the manner claimed.

135. To resolve the legal and factual questions raised by Cirba and to afford relief from the uncertainty and controversy that Cirba's allegations have created, VMware seeks a declaratory judgment that it does not infringe the '367 patent.

COUNTERCLAIM 8
(Declaratory Judgment of Invalidity of the '367 Patent)
(Against Cirba Inc. and Cirba IP, Inc.)

136. VMware re-alleges and incorporates by reference each allegation stated in paragraphs 1 through 102 above as if fully stated here.

137. The claims of the '367 patent are invalid for failing to meet one or more of the statutory and decisional conditions for patentability under Title 35 of the United States Code,

including, without limitation, §§ 101, 102, 103, and/or 112. For example, as Cirba apparently interprets asserted claim 1 in alleging that vROps infringes, VMware's vCenter Operations 1.0 anticipates at least claim 1 under pre-AIA 35 U.S.C. §§ 102(a), 102(b), and/or 102(g)(2) and/or renders at least claim 1 obvious alone or in combination with the knowledge of a person of ordinary skill in the art. vCenter Operations 1.0 included graphical displays of virtualization information that were substantively the same as Cirba is accusing of infringing claim 1 of the '367 patent.

138. To resolve the legal and factual questions raised by Cirba and to afford relief from the uncertainty and controversy that Cirba's allegations have created, VMware seeks a declaratory judgment that the '367 patent is invalid.

COUNTERCLAIM 9
(Declaratory Judgment that Cirba Owns No Protectable Trademark Rights
in Densify, Densification, or Densifying
(Against Cirba Inc. and Cirba IP, Inc.)

139. VMware re-alleges and incorporates by reference each allegation stated in paragraphs 1 through 102 above as if fully stated here.

140. The terms "densify," "densifying," and "densification" are merely descriptive of a function or characteristic of Cirba's products and services, including but not limited to, the products and services of downloadable and hosted software, including for analyzing a customer's utilization of computer systems and taking the necessary steps to automatically optimize such utilization or providing recommendations to optimizing utilization, for optimizing computer resource supply and demand in virtual and cloud environments, including by (a) analyzing a customer's workload patterns and requirements against its infrastructure capacity and capabilities in order to determine where workloads should be placed, how they should be combined within physical infrastructure and how resources should be allocated to them, (b) generating web-based

dashboards and reports that provide insights into operational risks, opportunities to drive efficiency, detailed forecasts and what-if scenarios, (c) generating action plans to implement and automate the optimization recommendations, and (d) making available web services to enable integration with on-premises provisioning and orchestration systems; consulting, training, technical assistance, educational, maintenance and support services relating to computer software; computer software development services; training in the use and operation of computer software; and education services in the field of computer software.

141. The terms “densify,” “densifying,” and “densification” also do not have secondary meaning in the market. As a result, they are not protectable trademarks.

142. To resolve the legal and factual questions raised by Cirba and to afford relief from the uncertainty and controversy that Cirba’s allegations have created, VMware seeks a declaration that Cirba does not have protectable trademark rights in the Asserted Marks.

**COUNTERCLAIM 10
(Declaratory Judgment of Fair Use)
(Against Cirba Inc. and Cirba IP, Inc.)**

143. VMware re-alleges and incorporates by reference each allegation stated in paragraphs 1 through 102 above as if fully stated here.

144. VMware’s use of the terms “densify,” “densifying,” and “densification” is not source-identifying trademark usage and constitutes fair use under 15 U.S.C. § 1115(b)(4), because VMware uses the terms in good faith for their ordinary descriptive meanings, not as trademarks, and in order to convey information about its products.

145. To resolve the legal and factual questions raised by Cirba and to afford relief from the uncertainty and controversy that Cirba’s allegations have created, VMware seeks a

declaration that VMware's use of the terms "densify," "densifying," and "densification" constitutes fair use.

COUNTERCLAIM 11
(Declaratory Judgment of No Trademark Infringement)
(Against Cirba Inc. and Cirba IP, Inc.)

146. VMware re-alleges and incorporates by reference each allegation stated in paragraphs 1 through 102 above as if fully stated here.

147. VMware's use of the terms "densify," "densifying," and "densification" does not constitute infringement of any trademark right belonging to Cirba, because there is no likelihood of confusion between VMware's use of those terms and the Asserted Marks.

148. To resolve the legal and factual questions raised by Cirba and to afford relief from the uncertainty and controversy that Cirba's allegations have created, VMware seeks a declaratory judgment that VMware's use of the terms "densify," "densifying," and "densification" does not infringe any rights that Cirba may have in the Asserted Marks.

PRAAYER FOR RELIEF

149. WHEREFORE, VMware prays for judgment as follows:

A. Entry of judgment against Cirba and dismissing the claims filed by Cirba against VMware with prejudice;

B. Entry of declaratory judgment that the claims of Cirba's asserted '687 and '367 patents are not infringed by VMware;

C. Entry of declaratory judgment that Cirba's asserted '687 and '367 patents are invalid or patent ineligible;

D. Entry of declaratory judgment that Cirba owns no protectable trademark rights in Densify, Densification, or Densifying;

E. Entry of declaratory judgment that VMware's use of the terms "densify," "densifying," and "densification" is not source-identifying trademark usage and constitutes fair use under 15 U.S.C. § 1115(b)(4);

F. Entry of declaratory judgment that VMware's use of the terms "densify," "densifying," and "densification" does not constitute infringement of any trademark right belonging to Cirba;

G. Award VMware monetary relief sufficient to compensate VMware for damages resulting from Cirba Inc.'s infringement of VMware's Asserted Patents, including lost profits and/or a reasonable royalty under 35 U.S.C. § 284, and that such monetary relief be awarded to VMware with prejudgment and post-judgment interest;

H. That Cirba Inc., its officers, agents, servants, and employees, and those persons in active concert or participation with any of them, be enjoined from commercially manufacturing, using, offering for sale, selling, or importing Cirba Inc.'s Accused Products or any other product that infringes, or induces or contributes to the infringement of VMware's Asserted Patents, prior to the expiration date of the last to expire of those patents;

I. Award VMware enhanced damages, up to and including trebling of the damages awarded to VMware;

J. Award VMware its costs, disbursements, and reasonable attorneys' fees incurred in this action that it incurs prosecuting this action under 35 U.S.C. § 285; and

K. Grant such other and further relief as the Court may deem just and proper.

JURY DEMAND

150. Pursuant to Rule 38 of the Federal Rules of Civil Procedure and D. Del. LR 38.1, VMware demands a trial by jury on all issues upon which it may have a trial by jury.

Dated: August 20, 2019

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CERTIFICATE OF SERVICE

I, Anne Shea Gaza, hereby certify that on August 20, 2019, I caused to be electronically filed a true and correct copy of the foregoing document with the Clerk of the Court using CM/ECF, which will send notification that such filing is available for viewing and downloading to the following counsel of record:

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I further certify that on August 20, 2019, I caused the foregoing document to be served via electronic mail upon the above-listed counsel and on the following:

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